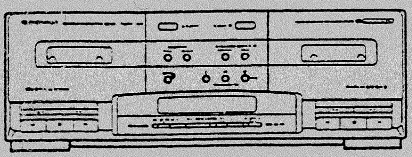
PIONEER®
*The Art of Entertainment*

# Service Manual



ORDER NO.
ARP2640

## STEREO DOUBLE CASSETTE TAPE DECK

# CT-J410WR
# CT-J310WR

### CT–J410WR AND CT–J310WR HAVE THE FOLLOWING:

| Type | Model | | Power Requirement | Remarks |
|---|---|---|---|---|
| | CT–J410WR | CT–J310WR | | |
| AEM | ○ | ○ | AC power supplied from power transformer's secondary of other system component | |
| AB | ○ | ○ | | |
| ADL | ○ | ○ | | |

- This manual is applicable to the following: CT–J410WR/AEM, AB and ADL; CT–J310WR/AEM, AB and ADL.
- These products are systems components.
  Each of these products does not function properly when independent; to avoid malfunctions, be sure to connect it to the prescribed system component (s), otherwise damage may result.
  These products' instructions are contained within the instruction manual of the related system component (s).
  The manual is packed with those component (s).
  These products' accessories etc. are packed with their related component (s).

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# 1. EXPLODED VIEWS AND PARTS LIST

## 1.1 EXTERIOR

NOTES:

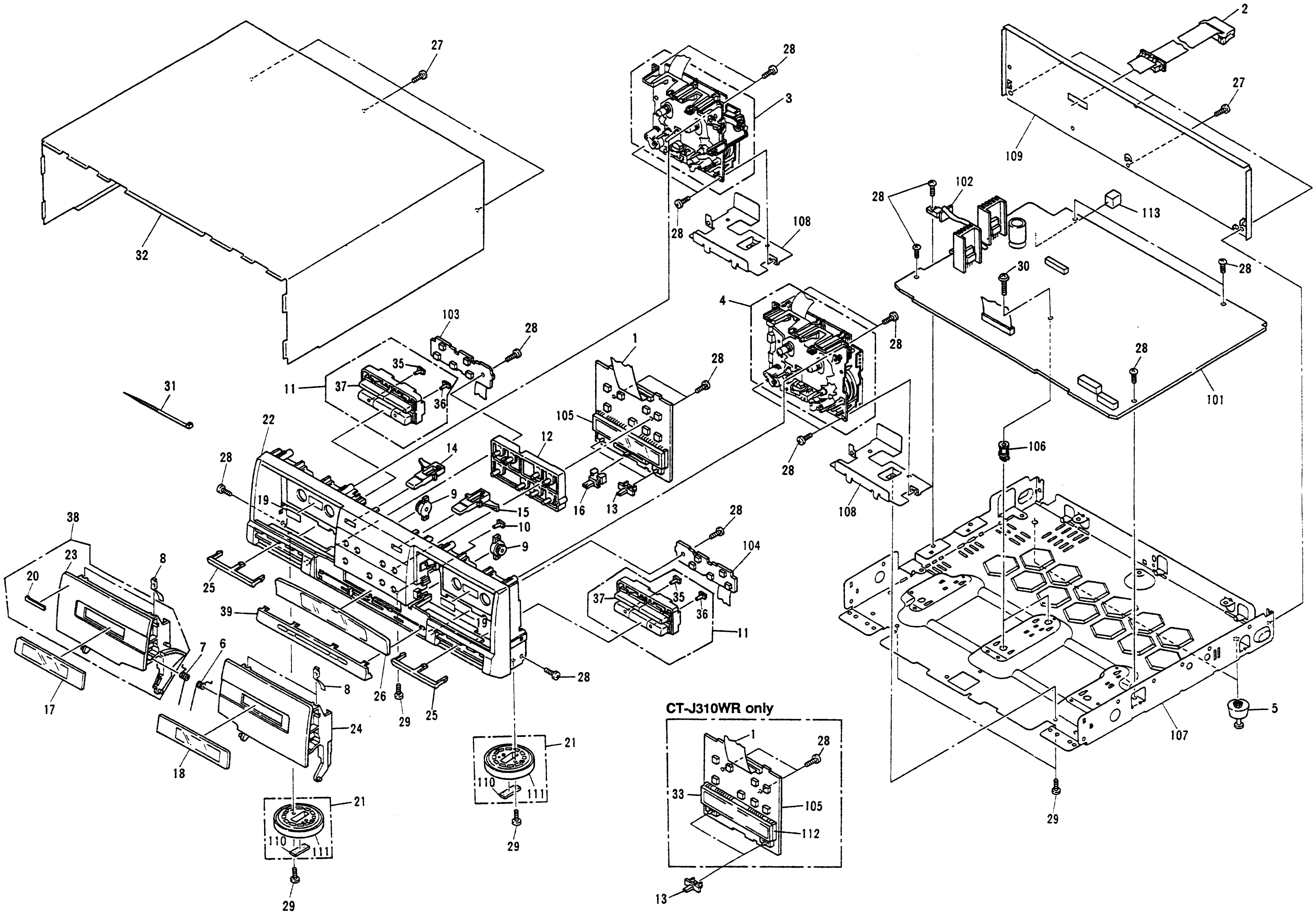
- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

### Parts List

| Mark | No. | Description | Part No. |
|---|---|---|---|
|  | 1 | Lead card (30P) (CT-J410WR) | RDD1261 |
|  |  | Lead card (28P) (CT-J310WR) | RDD1263 |
|  | 2 | Connector assembly (15P) | RKP1358 |
| ⊙ | 3 | Mechanism unit 1 | RYM1191 |
| ⊙ | 4 | Mechanism unit 2 (CT-J410WR) | RYM1192 |
| ⊙ |  | Mechanism unit 2 (CT-J310WR) | RYM1193 |
|  | 5 | Leg assembly (S) | AMR1937 |
|  | 6 | Door spring R | RBH1329 |
|  | 7 | Door spring L | RBH1328 |
|  | 8 | Half pressure spring | RBK1004 |
|  | 9 | Damper assembly | VXA1153 |
|  | 10 | Indicator lens | RNK1591 |
|  | 11 | Operation button Ass'y (CT-J410WR) | RXA1506 |
|  |  | Operation button Ass'y (CT-J310WR) | RXA1535 |
|  | 12 | Center knob | RAC1732 |
|  | 13 | Slide SW knob | RAC1774 |
|  | 14 | Eject knob L | RAC1767 |
|  | 15 | Eject knob R | RAC1768 |
|  | 16 | Slide VR knob (CT-J410WR) | RAC1737 |
|  | 17 | Door lens L | RAH2115 |
|  | 18 | Door lens R | RAH2114 |
|  | 19 | Remaining sheet | REE – 113 |
|  | 20 | Name plate | AAM1047 |
|  | 21 | Foot assembly | RXA1448 |
|  | 22 | Front panel (CT-J410WR) | RAH2106 |
|  |  | Front panel (CT-J310WR) | RAH2117 |
|  | 23 | Door panel L (CT-J410WR) | RAH2108 |
|  |  | Door panel L (CT-J310WR) | RAH2118 |
|  | 24 | Door panel R (CT-J410WR) | RAH2109 |
|  |  | Door panel R (CT-J310WR) | RAH2119 |
|  | 25 | Azimuth cover | RNK1849 |
|  | 26 | FL lens (CT-J410WR) | RAH2167 |
|  |  | FL lens (CT-J310WR) | RAH2120 |
|  | 27 | Screw | BBZ30P060FZK |
|  | 28 | Screw | BBZ30P080FMC |
|  | 29 | Screw | BBZ30P100FZK |
|  | 30 | Screw | IBZ30P150FCU |
|  | 31 | Cord clamper | REC – 371 |
|  | 32 | Bonnet assembly | REA1031 |
|  | 33 | LED lens (CT-J310WR) | RAH2015 |
|  | 34 | ······ |  |
| NSP | 35 | Indicator lens A (CT-J410WR) | RNK1850 |
| NSP |  | Indicator lens A (CT-J310WR) | RNK1888 |
| NSP | 36 | Indicator lens B (CT-J410WR) | RNK1851 |
| NSP |  | Indicator lens B (CT-J310WR) | RNK1889 |
|  | 37 | Operation knob | RAC1766 |
|  | 38 | Door L Ass'y (CT-J410WR) | REA1052 |
|  |  | Door L Ass'y (CT-J310WR) | REA1051 |
|  | 39 | Sub panel (CT-J410WR) | RAH2113 |
|  |  | Sub panel (CT-J310WR) | RAH2123 |
|  | 101 | Main unit (CT-J410WR) | RWZ2710 |
|  |  | Main unit (CT-J310WR) | RWZ2705 |
| NSP | 102 | Transistor unit | RWZ2711 |
| NSP | 103 | Operate 1 unit (CT-J410WR) | RWZ2713 |
| NSP |  | Operate 1 unit (CT-J310WR) | RWZ2708 |
| NSP | 104 | Operate 2 unit (CT-J410WR) | RWZ2714 |
| NSP |  | Operate 2 unit (CT-J310WR) | RWZ2709 |
|  | 105 | Display unit (CT-J410WR) | RWZ2712 |
|  |  | Display unit (CT-J310WR) | RWZ2707 |
| NSP | 106 | PCB spacer | PNY – 404 |
| NSP | 107 | Main chassis | RNB1072 |
| NSP | 108 | Mechanism shield plate | RNE1503 |
| NSP | 109 | Rear panel (CT-J410WR／AB) | RNA1605 |
| NSP |  | Rear panel (CT-J410WR／AEM, ADL) | RNA1653 |
| NSP |  | Rear panel (CT-J310WR／AB) | RNA1606 |
| NSP |  | Rear panel (CT-J310WR／AEM, ADL) | RNA1654 |
| NSP | 110 | Cushion | REB1091 |
| NSP | 111 | Foot | RNK1770 |
| NSP | 112 | LED holder (CT-J310WR) | RNK1810 |
| NSP | 113 | Unit spacer | PEB1164 |

## Exterior

**NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.**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110
111
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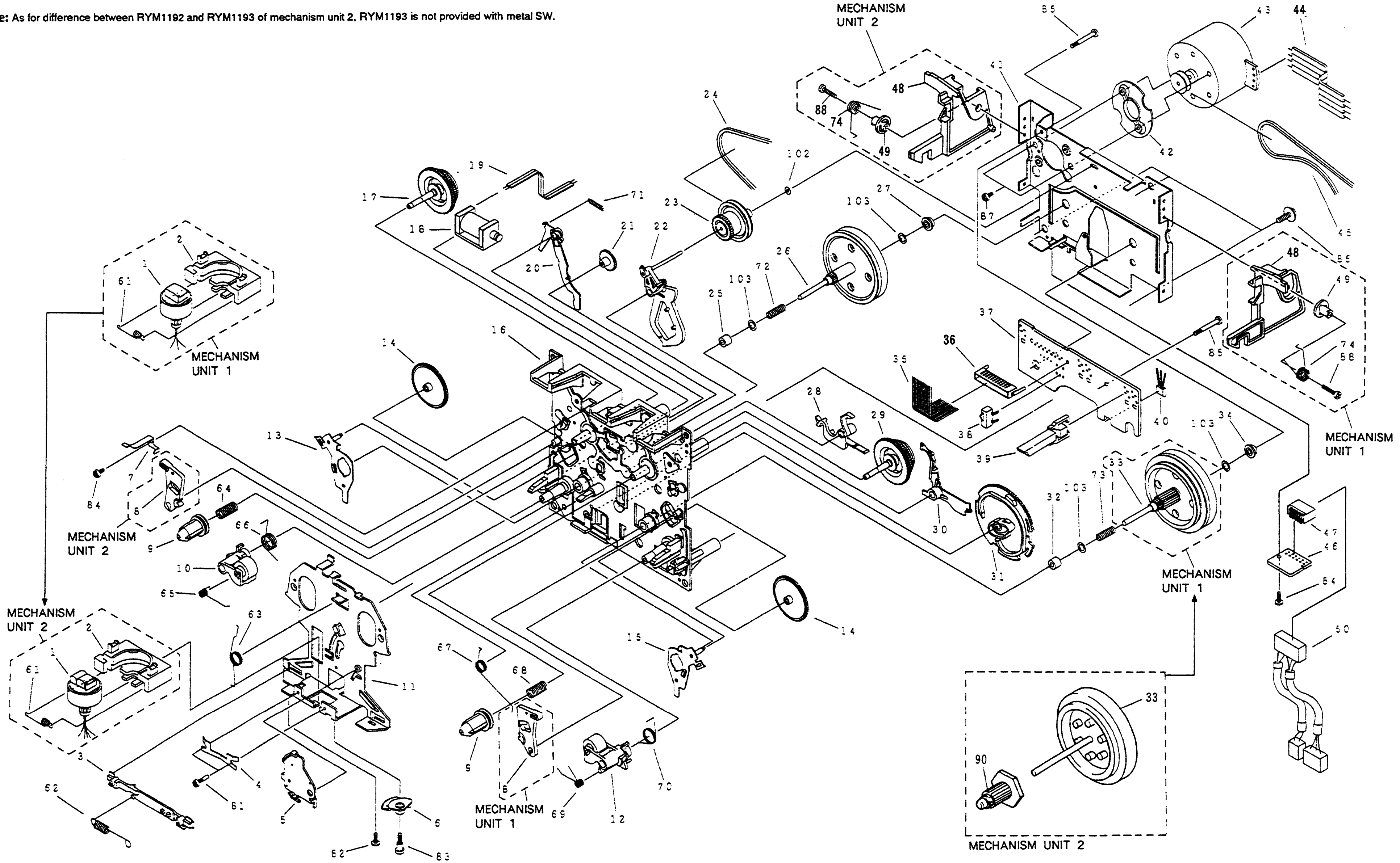
107
5
CT-J310WR only
1
28
33
105
112
13
29

## 1.2 MECHANISM UNIT 1 (RYM1191): CT–J410WR and CT–J310WR
## MECHANISM UNIT 2 (RYM1192): CT–J410WR
## MECHANISM UNIT 2 (RYM1193): CT–J310WR

**Note:** As for difference between RYM1192 and RYM1193 of mechanism unit 2, RYM1193 is not provided with metal SW.


MECHANISM UNIT 2
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1
MECHANISM UNIT 1
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MECHANISM UNIT 1
MECHANISM UNIT 2
MECHANISM UNIT 1
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MECHANISM UNIT 2
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MECHANISM UNIT 2
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1
61
11
67
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33
90
3
62
81
4
5
6
82
83
9
8
MECHANISM UNIT 1
69
12
70
MECHANISM UNIT 2

## Parts List

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 1 | ASS'Y HOLDER HEAD (Mechanism unit 2) | RXA1477 |
| | | ASS'Y HOLDER HEAD (Mechanism unit 1) | RXA1500 |
| | 2 | FLAME HEAD | RNK1715 |
| | 3 | LEVER HEAD | RNK1716 |
| | 4 | SPRING AZIMUTH | RBK1006 |
| | 5 | ASS'Y ARM ASSIST | RXA1401 |
| | 6 | GEAR ARM HEAD | RNK1717 |
| | 7 | SPRING CASSETTE | RBK1039 |
| | 8 | EJECT LOCK | RNK1718 |
| | 9 | CAP REEL | RNK1719 |
| | 10 | ASS'Y PINCH ARM L | RXA1403 |
| | 11 | CHASSIS HEAD | RNE1437 |
| | 12 | ASS'Y PINCH ARM R | RXA1404 |
| | 13 | ARM PLAY L | RNK1866 |
| | 14 | GEAR PLAY | RNK1867 |
| | 15 | ARM PLAY R | RNK1868 |
| | 16 | CHASSIS OS. | RXA1411 |
| | 17 | ASS'Y SUB REEL L | RXA1407 |
| ⚠ | 18 | SOLENOID | RXP1020 |
| | 19 | WIRE | RDC1006 |
| | 20 | ARM RVS | RNK1721 |
| | 21 | GEAR FF | RNK1723 |
| | 22 | ASS'Y ARM FR | RXA1412 |
| | 23 | ASS'Y PULLEY FR | RXA1413 |
| | 24 | BELT FR | REB1158 |
| | 25 | METAL | RNG1048 |
| | 26 | ASS'Y FLYWHEEL L (Mechanism unit 1) | RXA1423 |
| | | ASS'Y FLYWHEEL L (Mechanism unit 2) | RXA1476 |
| | 27 | METAL | RNG1005 |
| | 28 | ARM BRAKE | RNK1724 |
| | 29 | ASS'Y SUB REEL R | RXA1408 |
| | 30 | ARM TRIGGER | RNK1722 |
| | 31 | GEAR CAM | RNK1725 |
| | 32 | METAL | RNG1049 |
| | 33 | ASS'Y FLYWHEEL R (Mechanism unit 1) | RXA1424 |
| | | ASS'Y FLYWHEEL R (Mechanism unit 2) | RXA1415 |
| | 34 | METAL | RNG1004 |
| | 35 | WIRE (14P) (Mechanism unit 2) | RDD1217 |
| | | WIRE (12P) (Mechanism unit 1) | RDD1249 |
| | 36 | HOLDER WIRE | RNK1683 |
| | 37 | P.C. BOARD | RNP1436 |
| | 38 | SWITCH MODE | RSN1020 |
| | 39 | SWITCH (LEAF) | RSN1019 |
| | 40 | HALL IC. | DN6851A |
| | 41 | BRACKET FW | RNE1438 |
| | 42 | SPACER | RNK1822 |
| | 43 | ASS'Y MOTOR (Mechanism unit 2) | RXM1063 |
| | | ASS'Y MOTOR (Mechanism unit 1) | RXM1062 |
| | 44 | WIRE | RDD1012 |
| | 45 | BELT MAIN (Mechanism unit 1) | REB1159 |
| | | BELT MAIN (Mechanism unit 2) | REB1162 |
| | 46 | P.C. BOARD | RNP1348 |
| | 47 | HOUSING (Mechanism unit 2) | RKP1397 |
| | | HOUSING (Mechanism unit 1) | RKP1396 |
| | 48 | EJECT LEVER L (Mechanism unit 2) | RNK1702 |
| | | EJECT LEVER R (Mechanism unit 1) | RNK1703 |
| | 49 | COLLAR | RNK1704 |
| | 50 | WIRE HEAD (Mechanism unit 2) | RKP1502 |
| | | WIRE HEAD (Mechanism unit 1) | RKP1501 |
| | 61 | SPRING | RBH1282 |
| | 62 | SPRING | RBH1283 |
| | 63 | SPRING | RBH1284 |
| | 64 | SPRING | RBH1286 |
| | 65 | SPRING | RBH1288 |
| | 66 | SPRING | RBH1291 |
| | 67 | SPRING | RBH1285 |
| | 68 | SPRING | RBH1287 |
| | 69 | SPRING | RBH1289 |
| | 70 | SPRING | RBH1290 |
| | 71 | SPRING | RBH1292 |
| | 72 | SPRING | RBH1061 |
| | 73 | SPRING | RBH1325 |
| | 74 | SPRING (L) (Mechanism unit 2) | RBH1294 |
| | | SPRING (R) (Mechanism unit 1) | RBH1293 |
| | 81 | SCREW | RBA1023 |
| | 82 | SCREW | RBA1027 |
| | 83 | SCREW | RBA1030 |
| | 84 | SCREW | PCZ20P040FMC |
| | 85 | SCREW | RBA1093 |
| | 86 | SCREW | RBA1094 |
| | 87 | SCREW | RBA1100 |
| | 88 | SCREW | RBA1095 |
| | 89 | ...... | |
| | 90 | GEAR FW R (Mechanism unit 2) | RNK1733 |
| | 101 | ...... | |
| | 102 | WASHER | RBF1046 |
| | 103 | WASHER | WA26D047D013 |

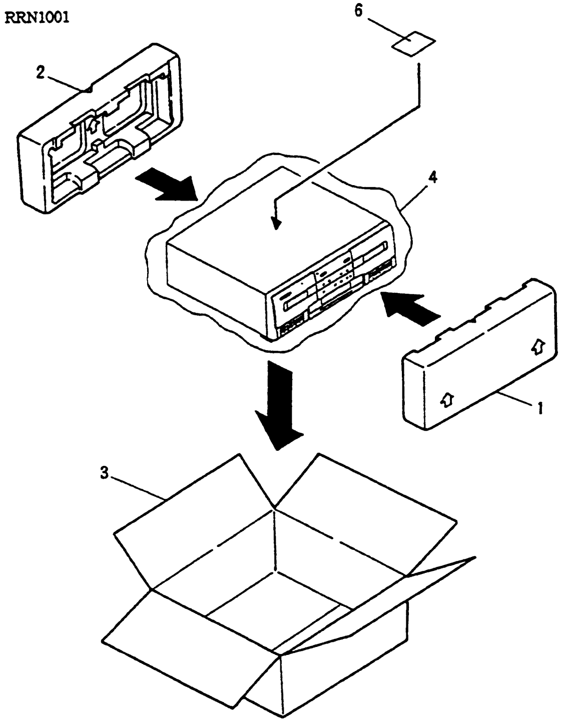
# 2. PACKING AND PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The iustruction manual is packed with the units of M–J310 and M–J410.

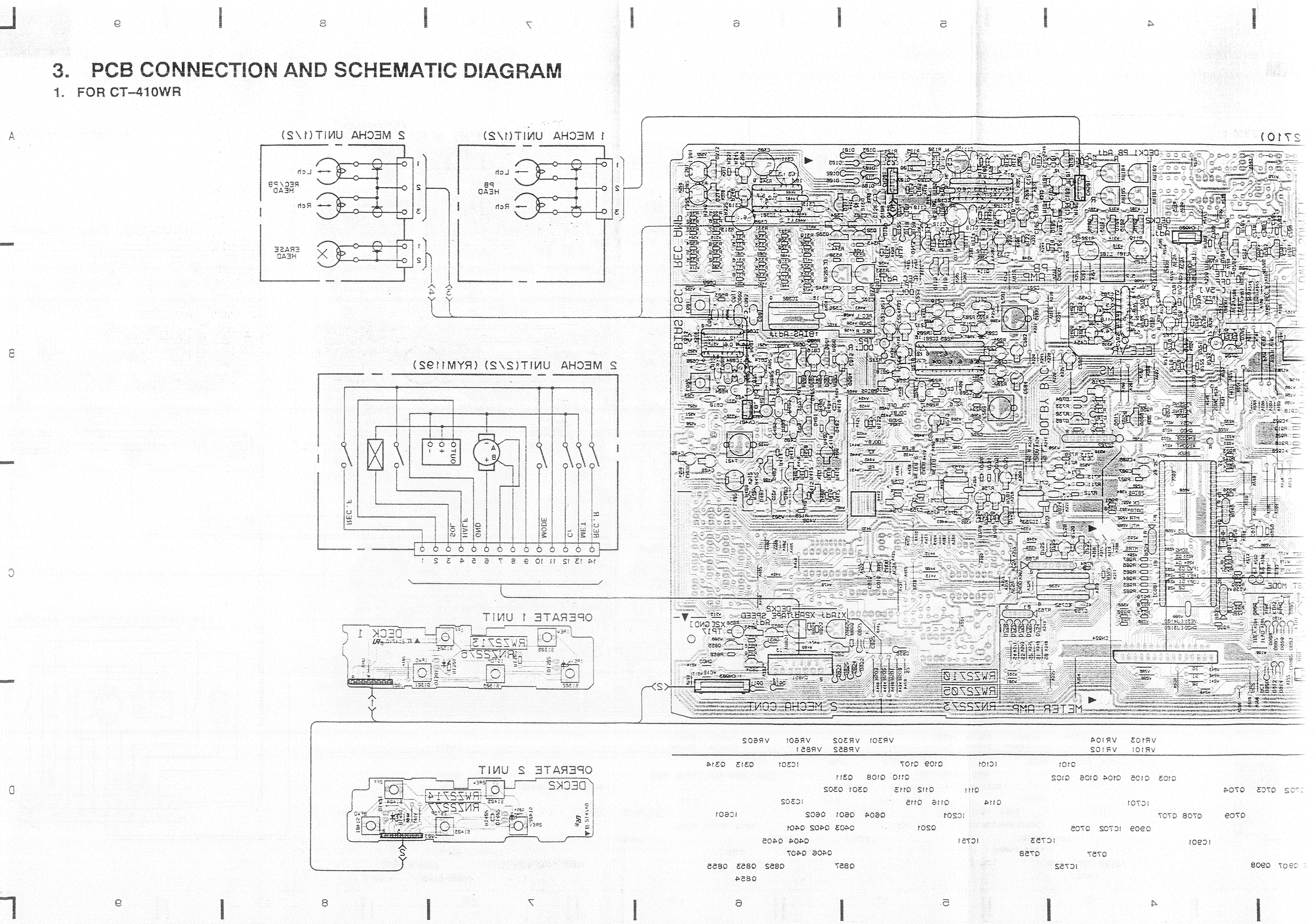
## Parts List

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 1 | Pad (F) | RHA1100 |
| | 2 | Pad (R) | RHA1102 |
| | 3 | Packing case (CT-J410WR/AB, AEM) | RHG1393 |
| | | Packing case (CT-J410WR/ADL) | RHG1424 |
| | | Packing case (CT-J310WR/AB, AEM) | RHG1394 |
| | | Packing case (CT-J310WR/ADL) | RHG1425 |
| | 4 | Sheet | RHX1006 |
| | 5 | ...... | |
| | 6 | Caution card (CT-J410WR/AB, CT-J310WR/AB only) | RRN1001 |

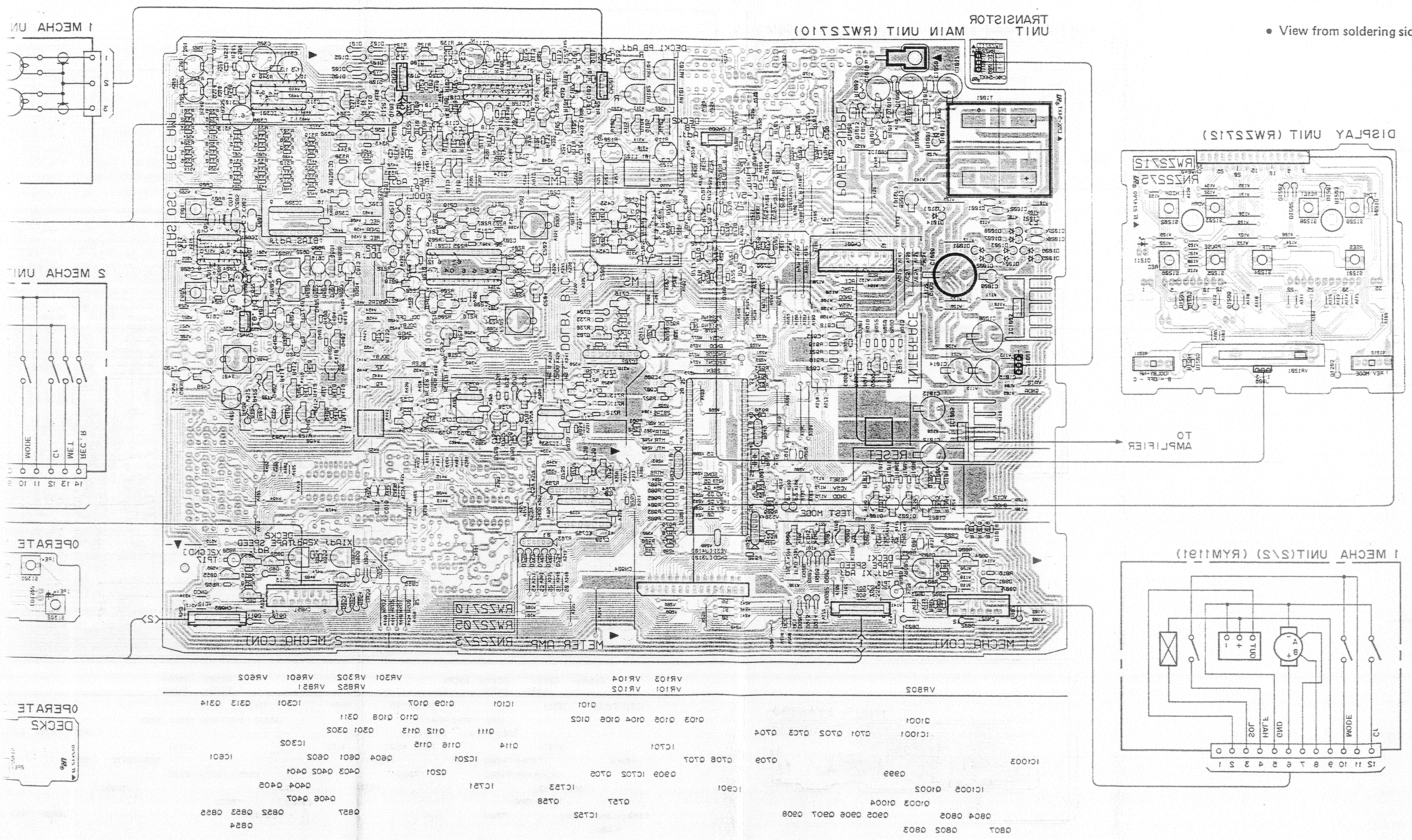


## 3. PCB CONNECTION AND SCHEMATIC DIAGRAM

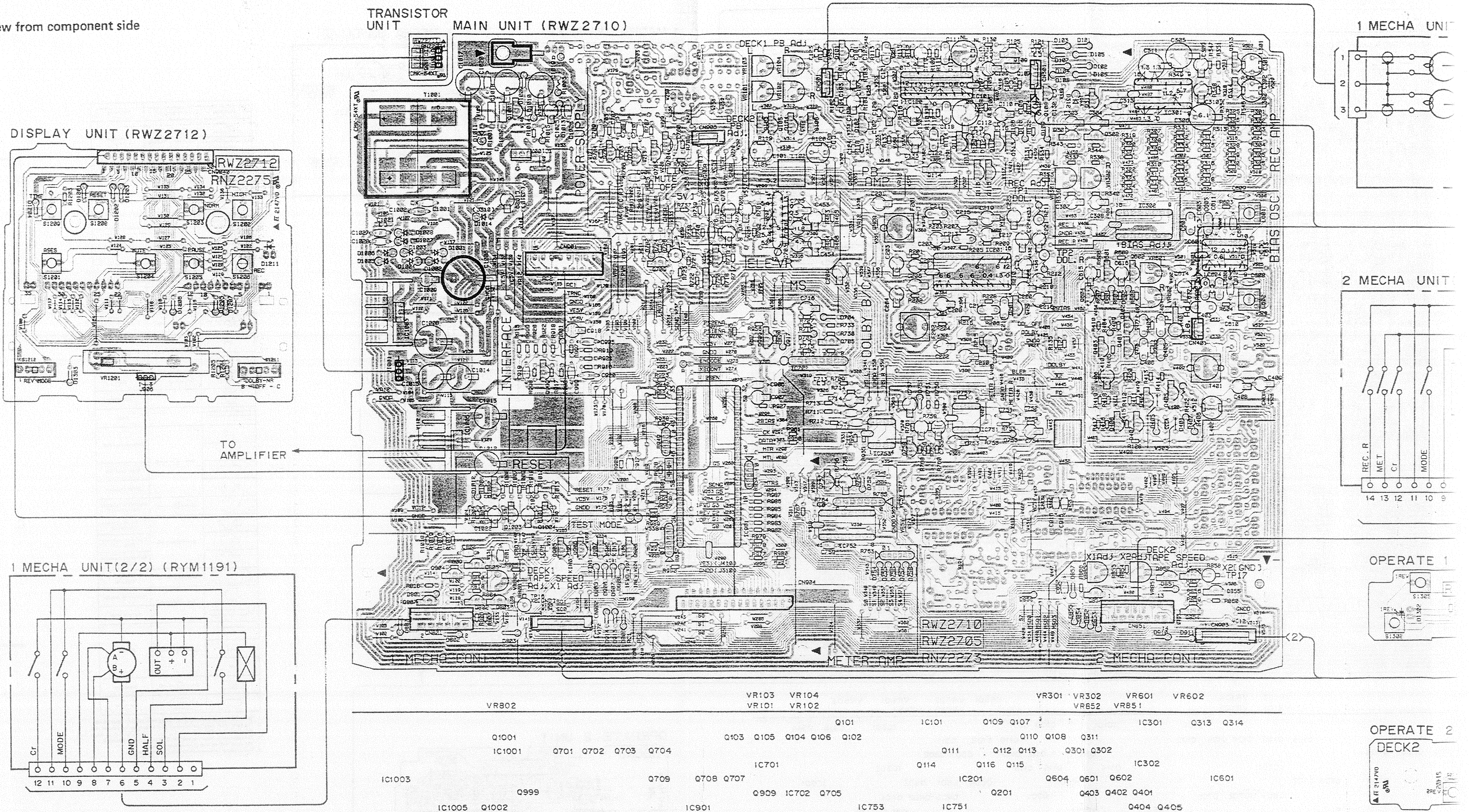
### 1. FOR CT–410WR


A
B
C
D
2 MECHA UNIT(1/2)
1 MECHA UNIT(1/2)
REC/PB HEAD
PB HEAD
ERASE HEAD
Lch
Rch
2 MECHA UNIT(2/2) (RYM1192)
REC. F
SOL
HALF
GND
MODE
MET.
REC. R
OPERATE 1 UNIT
DECK 1
RWZ2713
RNZ2276
OPERATE 2 UNIT
DECK2
RWZ2714
RNZ2277
DECK1 PB AMP
REC AMP
BIAS OSC
DOLBY B/C
PB AMP
METER AMP
2 MECHA CONT
RWZ2710
RWZ2705
RNZ2273
TAPE SPEED
TEST MODE

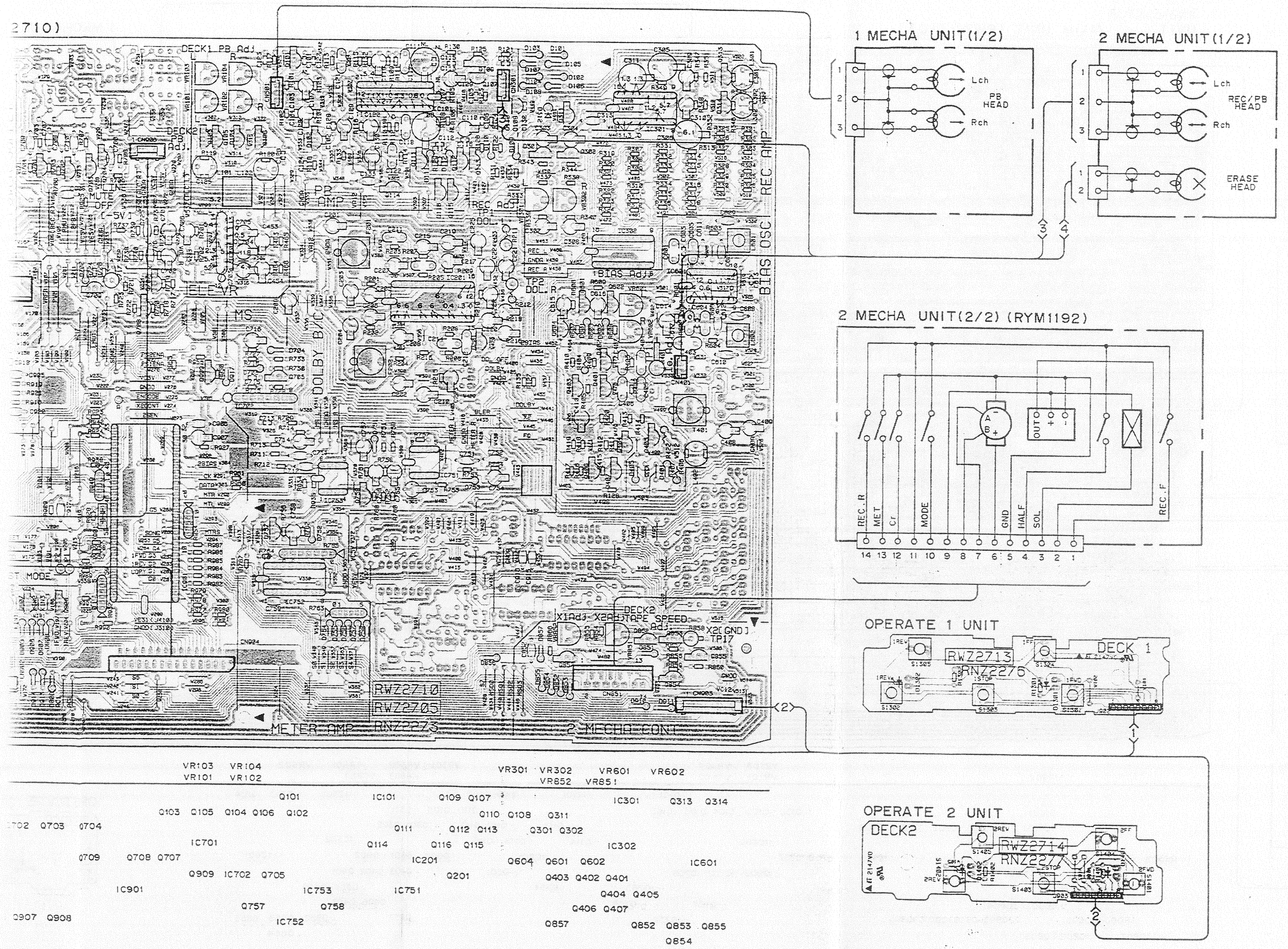
- View from soldering side

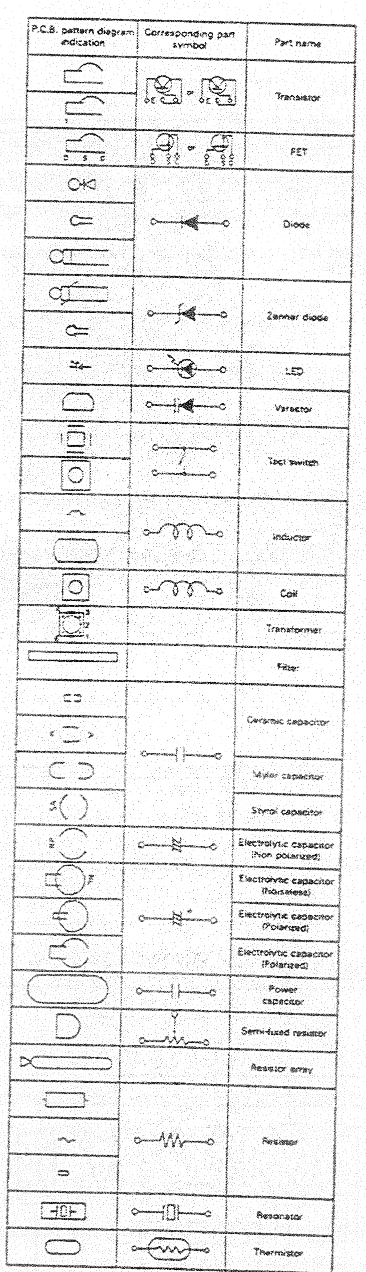

MAIN UNIT (RWZ2710)
TRANSISTOR UNIT
DISPLAY UNIT (RWZ2712)
1 MECHA UNIT(2/2) (RYM1191)
1 MECHA UNIT
2 MECHA UNIT
OPERATE
DECK2
TO AMPLIFIER
REC AMP
BIAS OSC
POWER SUPPLY
INTERFACE
DOLBY NR
RESET
TEST MODE
METER AMP
1 MECHA CONT
2 MECHA CONT
RWZ2710
RWZ2705
RNZ2273
RWZ2712
RNZ2275
MODE
REC R
MEM
JOG
HALF
GND
MUT

- View from component side


TRANSISTOR UNIT
MAIN UNIT (RWZ2710)
DISPLAY UNIT (RWZ2712)
RWZ2712
RNZ2275
1 MECHA UNIT
2 MECHA UNIT
OPERATE 1
OPERATE 2
DECK2
TO AMPLIFIER
1 MECHA UNIT(2/2) (RYM1191)
POWER SUPPLY
INTERFACE
RESET
TEST MODE
DECK1 PB Adj.
DECK2 PB Adj.
PB AMP
REC AMP
BIAS OSC
BIAS Adj.
DOLBY B/C
ELE VR
MS
DECK1 TAPE SPEED Adj. X1 Adj.
X1Adj. X2Adj. DECK2 TAPE SPEED Adj.
X2(GND) TP17
RWZ2710
RWZ2705
RNZ2273
1 MECHA CONT
METER AMP
2 MECHA CONT
REC.R MET Cr MODE
Cr MODE GND HALF SOL

VR103 VR104 VR301 VR302 VR601 VR602
VR802 VR101 VR102 VR852 VR851
Q101 IC101 Q109 Q107 IC301 Q313 Q314
Q1001 Q103 Q105 Q104 Q106 Q102 Q110 Q108 Q311
IC1001 Q701 Q702 Q703 Q704 Q111 Q112 Q113 Q301 Q302
IC701 Q114 Q116 Q115 IC302
IC1003 Q709 Q708 Q707 IC201 Q604 Q601 Q602 IC601
Q999 Q909 IC702 Q705 Q201 Q403 Q402 Q401
IC1005 Q1002 IC901 IC753 IC751 Q404 Q405
Q1003 Q1004 Q757 Q758 Q406 Q407
Q804 Q805 Q905 Q906 Q907 Q908 IC752 Q857 Q852 Q853 Q855
Q807 Q802 Q803 Q854

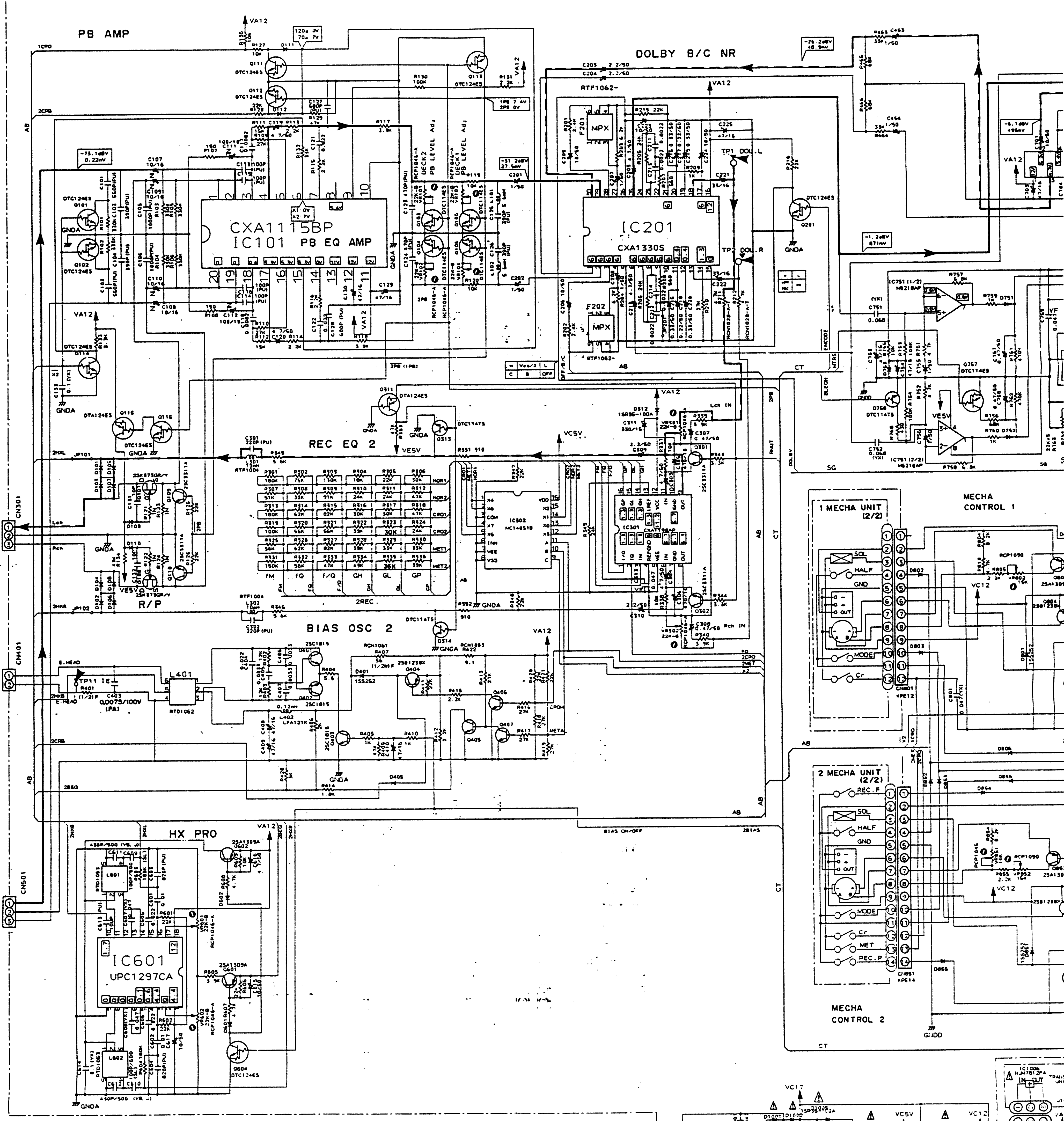

2710)
DECK1 PB Adj
DECK2 PB Adj
PB AMP
REC AMP
BIAS OSC
BIAS Adj
DOLBY B/C
ELE VR
MS
REC DOL
TP2 DOL R
METER AMP
2 MECHA CONT
RWZ2710
RWZ2705
RNZ2273
DECK2 X1Adj X2Adj TAPE SPEED Adj
X2 GND
TP17
1 MECHA UNIT(1/2)
Lch
Rch
PB HEAD
2 MECHA UNIT(1/2)
REC/PB HEAD
ERASE HEAD
2 MECHA UNIT(2/2) (RYM1192)
REC.R
MET
Cr
MODE
GND
HALF
SOL
REC.F
14 13 12 11 10 9 8 7 6 5 4 3 2 1
OUTO
OPERATE 1 UNIT
DECK 1
RWZ2713
RNZ2276
OPERATE 2 UNIT
DECK2
RWZ2714
RNZ2277
VR103 VR104
VR101 VR102
VR301 VR302
VR852 VR851
VR601 VR602
Q101
Q103 Q105 Q104 Q106 Q102
IC101
Q109 Q107
Q110 Q108
Q311
Q111 Q112 Q113
Q301 Q302
IC301
Q313 Q314
Q702 Q703 Q704
IC701
Q114 Q116 Q115
IC302
Q709 Q708 Q707
IC201
Q604 Q601 Q602
IC601
Q909 IC702 Q705
Q201
Q403 Q402 Q401
IC901
IC753
IC751
Q404 Q405
Q757 Q758
Q406 Q407
Q907 Q908
IC752
Q857
Q852 Q853 Q855
Q854
4 5 6 7 8 9
A B C D

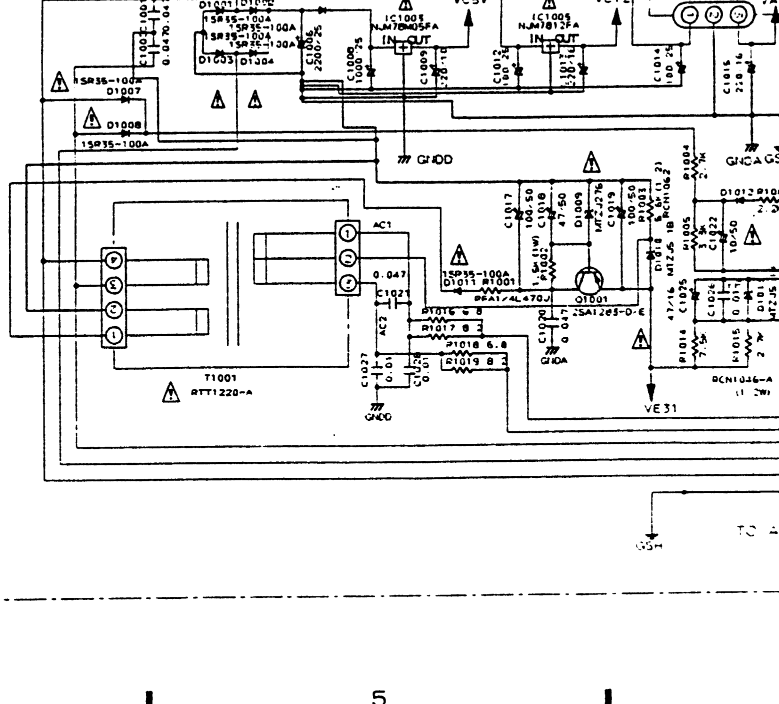


| P.C.B. pattern diagram indication | Corresponding part symbol | Part name |
|---|---|---|
| | | Transistor |
| | | FET |
| | | Diode |
| | | Zenner diode |
| | | LED |
| | | Varactor |
| | | Tact switch |
| | | Inductor |
| | | Coil |
| | | Transformer |
| | | Filter |
| | | Ceramic capacitor |
| | | Mylar capacitor |
| | | Styrol capacitor |
| | | Electrolytic capacitor (Non polarized) |
| | | Electrolytic capacitor (Noiseless) |
| | | Electrolytic capacitor (Polarized) |
| | | Electrolytic capacitor (Polarized) |
| | | Power capacitor |
| | | Semi-fixed resistor |
| | | Resistor array |
| | | Resistor |
| | | Resonator |
| | | Thermistor |

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

## MAIN UNIT (RWZ2710)


PB AMP
CXA1115BP
IC101 PB EQ AMP
DOLBY B/C NR
IC201
CXA1330S
RTF1062-
MPX
F201
F202
TP1 DOL.L
TP2 DOL.R
REC EQ 2
IC302
MC14051B
IC301
CXA1198AP
R/P
BIAS OSC 2
L401
RTD1062
HX PRO
IC601
UPC1297CA
2 MECHA UNIT (1/2)
REC/PB HEAD
RPB1016
RYM1192
E.HEAD
RPB1002
1 MECHA UNIT (1/2)
PB.HEAD
RPB1016
RYM1191
CN301
CN401
CN501
VA12
VC5V
VE5V
GNDA
1 MECHA UNIT (2/2)
MECHA CONTROL 1
2 MECHA UNIT (2/2)
MECHA CONTROL 2
SOL
HALF
GND
MODE
Cr
MET
REC.F
REC.P
CN801
KPE12
CN851
KPE14
IC751 (1/2) M5218AP
IC751 (2/2) M5218AP
BIAS ON/OFF
2BIAS
AB
CT
SG
GNDD


VC17
VC5V
VC12
IC1003
NJM78M05FA
IC1005
NJM7812FA
IC1006
NJM7812FA
T1001
RTT1220-A
AC1
Q1001
2SA1265-O-E
GNDD
VE31

Note: (Type 6)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**

2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**

3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.

4. **CAPACITORS:**
   Unit: p:pF or µF unless otherwise noted.
   Ratings: capacitor (µF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.

5. **COILS:**
   Unit: m:mH or µH unless otherwise noted.

6. **VOLTAGE AND CURRENT:**
   ▭ : DC voltage (V) in STOP mode unless otherwise noted.
   ⇦ mA or − mA: DC current in STOP mode unless otherwise noted.

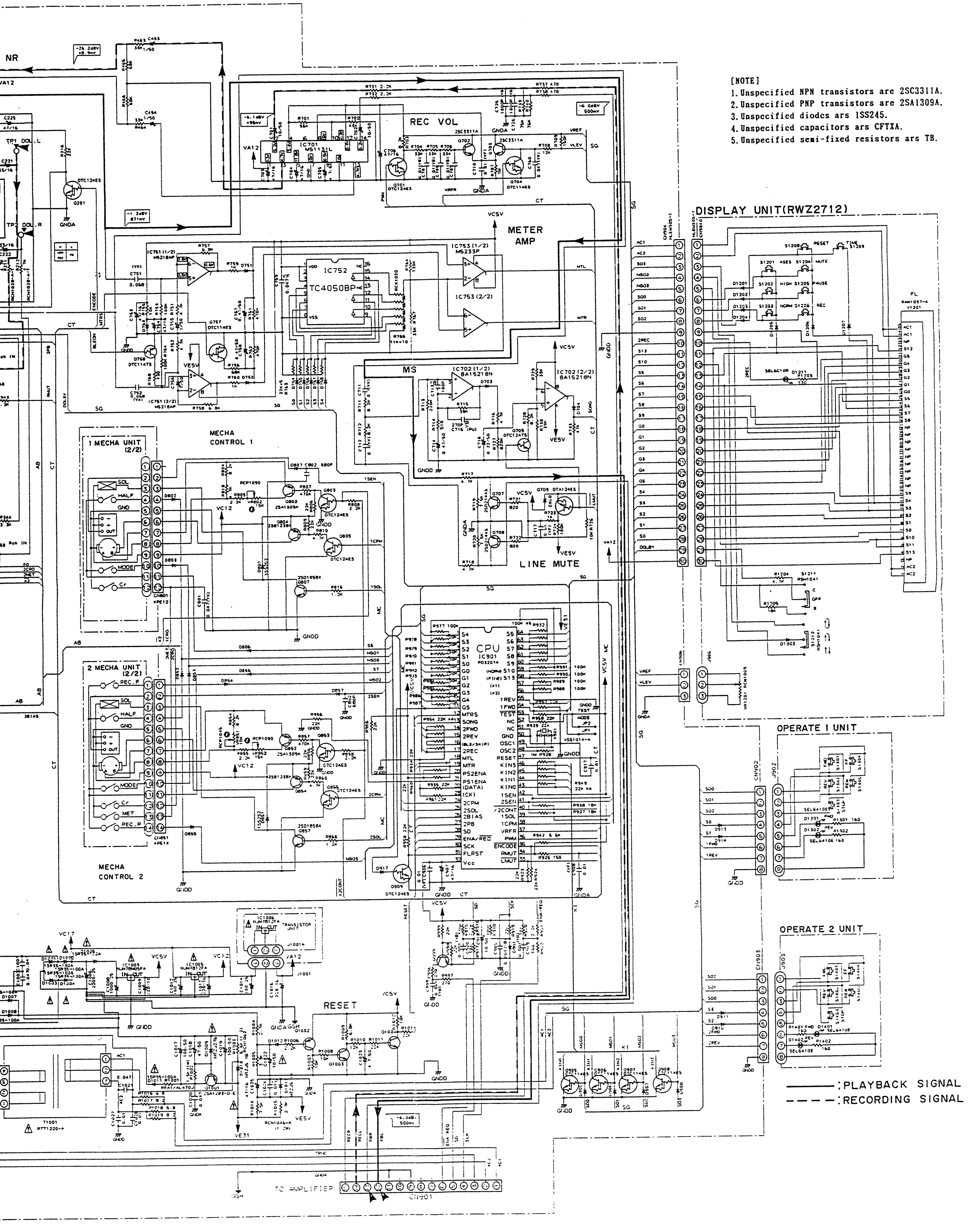
7. **OTHERS:**
   - ➡ : Signal route.
   - ⊘ : Adjusting point.
   - ▼ (Red) : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. **SWITCHES** (Underline indicates switch position):

DISPLAY UNIT
S1201 : ASES
S1202 : HIGH
S1203 : NORM
S1204 : MUTE
S1205 : PAUSE
S1206 : REC
S1211 : DOLBY B − OFF − C
S1212 : REV MODE ⇄ − ⊃ − ⟲

OPERATE1 UNIT
S1301 : FWD
S1302 : REV
S1303 : STOP
S1304 : FF
S1305 : REW

OPERATE2 UNIT
S1401 : FWD
S1402 : REV
S1403 : STOP
S1404 : FF
S1405 : REW

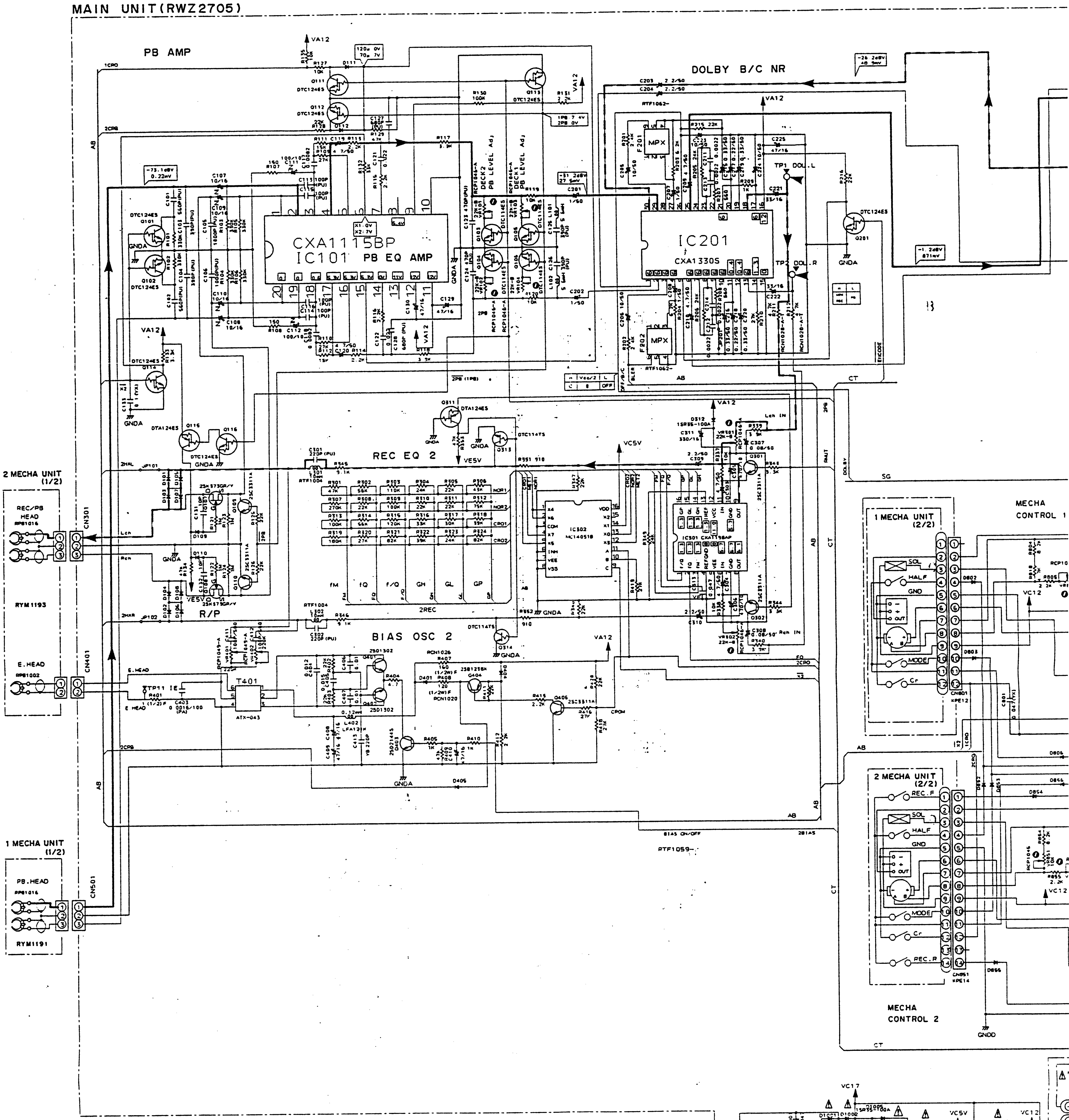

NR
REC VOL
IC701 M51131L
METER AMP
IC751 (1/2) M5218AP
IC752 TC4050BP
IC753 (1/2) M5235P
IC753 (2/2)
IC702 (1/2) BA15218N
IC702 (2/2) BA15218N
MS
LINE MUTE
MECHA CONTROL 1
1 MECHA UNIT (2/2)
2 MECHA UNIT (2/2)
MECHA CONTROL 2
CN801 KPE12
CN851 KPE14
CPU IC901 PD5207A
DISPLAY UNIT(RWZ2712)
FL RAW1097-A V1201
OPERATE 1 UNIT
OPERATE 2 UNIT
RESET
IC1006 NJM7812FA
IC1003 NJM78L05FA
IC1005 NJM7812FA
T1001 RTT1220-A
TO AMPLIFIER
CN901

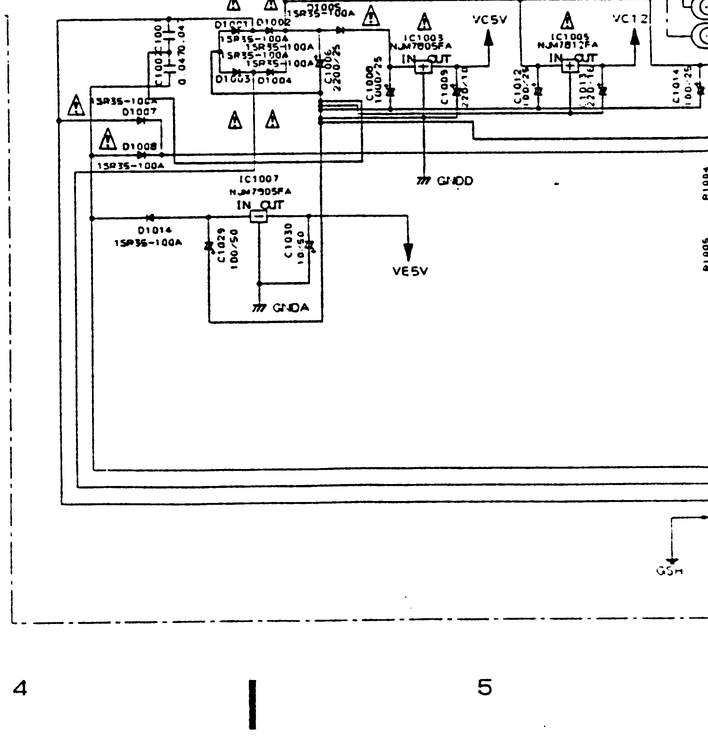
[NOTE]

1. Unspecified NPN transistors are 2SC3311A.
2. Unspecified PNP transistors are 2SA1309A.
3. Unspecified diodes ars 1SS245.
4. Unspecified capacitors ars CFTXA.
5. Unspecified semi-fixed resistors ars TB.

——— :PLAYBACK SIGNAL

– – – :RECORDING SIGNAL


MAIN UNIT(RWZ2705)
PB AMP
DOLBY B/C NR
CXA1115BP
IC101 PB EQ AMP
IC201
CXA1330S
MPX
F201
F202
TP1 DOL.L
TP2 DOL.R
REC EQ 2
IC502
MC14051B
IC501 CXA1158AP
BIAS OSC 2
T401
ATX-043
R/P
2 MECHA UNIT (1/2)
REC/PB HEAD
RYM1193
CN301
E.HEAD
CN401
1 MECHA UNIT (1/2)
PB.HEAD
RYM1191
CN501
MECHA CONTROL 1
1 MECHA UNIT (2/2)
SOL
HALF
GND
OUT
MODE
Cr
CN801
2 MECHA UNIT (2/2)
REC.F
REC.R
CN851
MECHA CONTROL 2
VA12
VC5V
VE5V
GNDA
GNDD
AB
CT
SG
BIAS ON/OFF
2BIAS
3
4
5


VC17
IC1007
NJM7505FA
IN OUT
IC1003
VC5V
VC12
VE5V
GNDD
GNDA
D1014

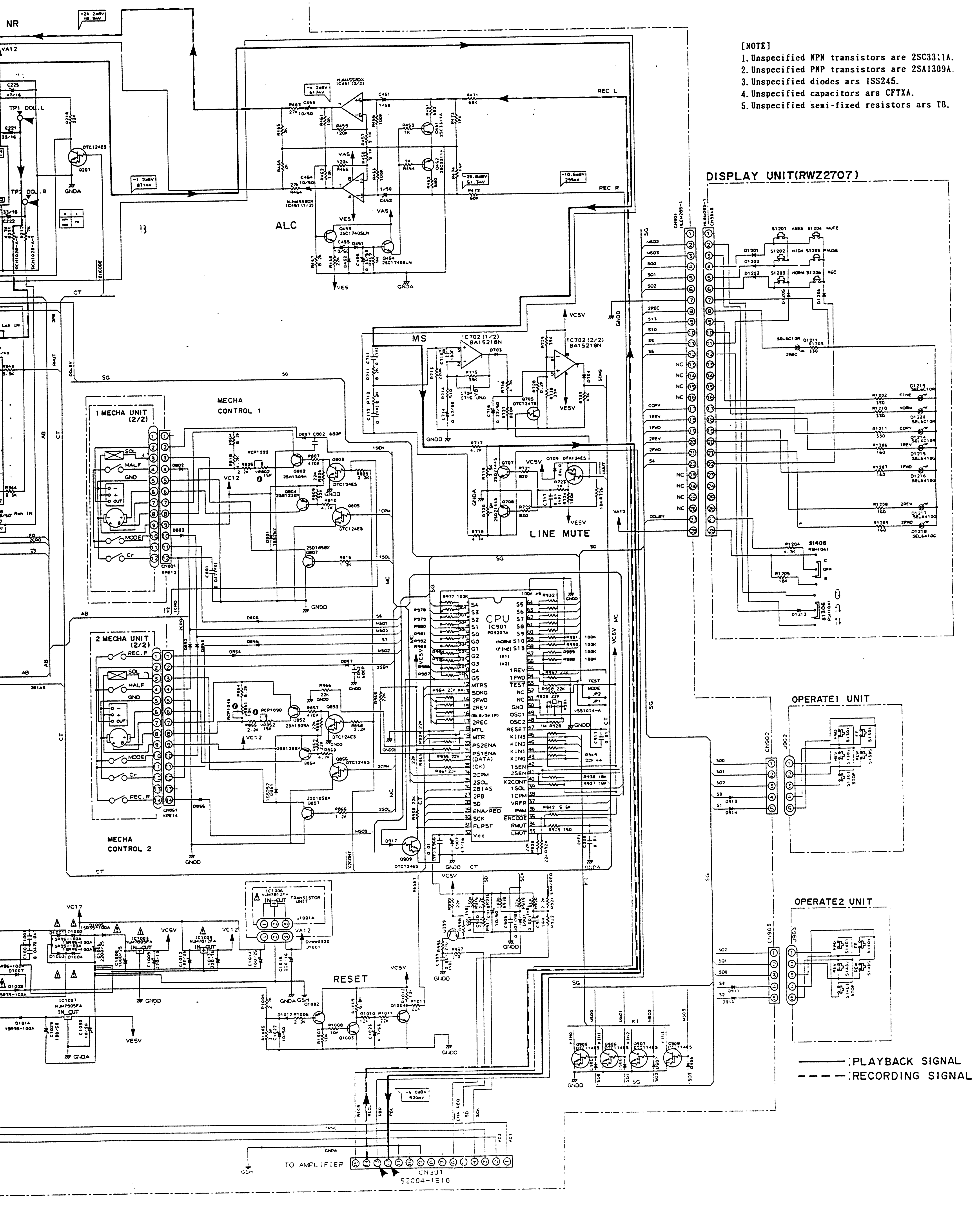
Note: (Type 6)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.
3. RESISTORS:
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. CAPACITORS:
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. COILS:
   Unit: m:mH or μH unless otherwise noted.
6. VOLTAGE AND CURRENT:
   ▭ : DC voltage (V) in STOP mode unless otherwise noted.
   ⇦ mA or ← mA: DC current in STOP mode unless otherwise noted.
7. OTHERS:
   - ➡ : Signal route.
   - ⊘ : Adjusting point.
   - ▼ (Red) : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. SWITCHES (Underline indicates switch position):

DISPLAY UNIT
S1201 : ASES
S1202 : HIGH
S1203 : NORM
S1204 : MUTE
S1205 : PAUSE
S1206 : REC
S1306 : DOLBY B – OFF – C
S1406 : REV MODE ⇄ – ⊃ – ○

OPERATE1 UNIT
S1301 : FWD
S1302 : REV
S1303 : STOP
S1304 : FF
S1305 : REW

OPERATE2 UNIT
S1401 : FWD
S1402 : REV
S1403 : STOP
S1404 : FF
S1405 : REW


NR
ALC
MS
LINE MUTE
DISPLAY UNIT(RWZ2707)
MECHA CONTROL 1
1 MECHA UNIT (2/2)
2 MECHA UNIT (2/2)
MECHA CONTROL 2
CPU IC901 PD5207A
OPERATE1 UNIT
OPERATE2 UNIT
RESET
REC L
REC R
IC702 (1/2) BA15218N
IC702 (2/2) BA15218N
NJM4558DX IC451 (2/2)
NJM4558DX IC451 (1/2)
IC1006 NJM7812FA
IC1005 NJM7812FA
IC1003 NJM7805FA
IC1007 NJM7905FA
TO AMPLIFIER
CN301 52004-1510
CN801 KPE12
CN851 KPE14
CN902
CN903
J902
J903
S1406
S1306
VC5V
VA12
VC12
VC17
VE5V
VES
VA5
GNDA
GNDD
GSH
5
6
7
8
9

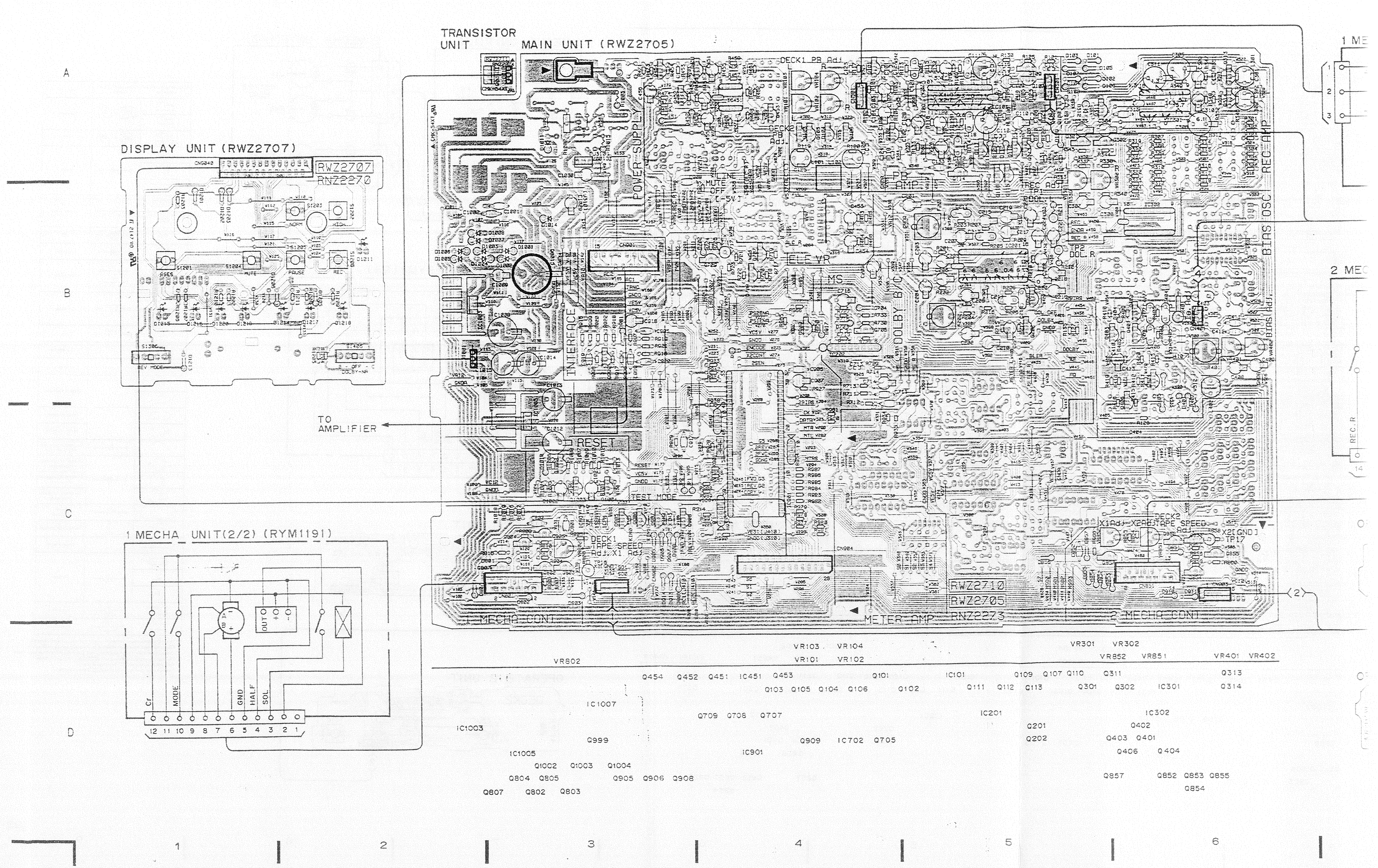
[NOTE]

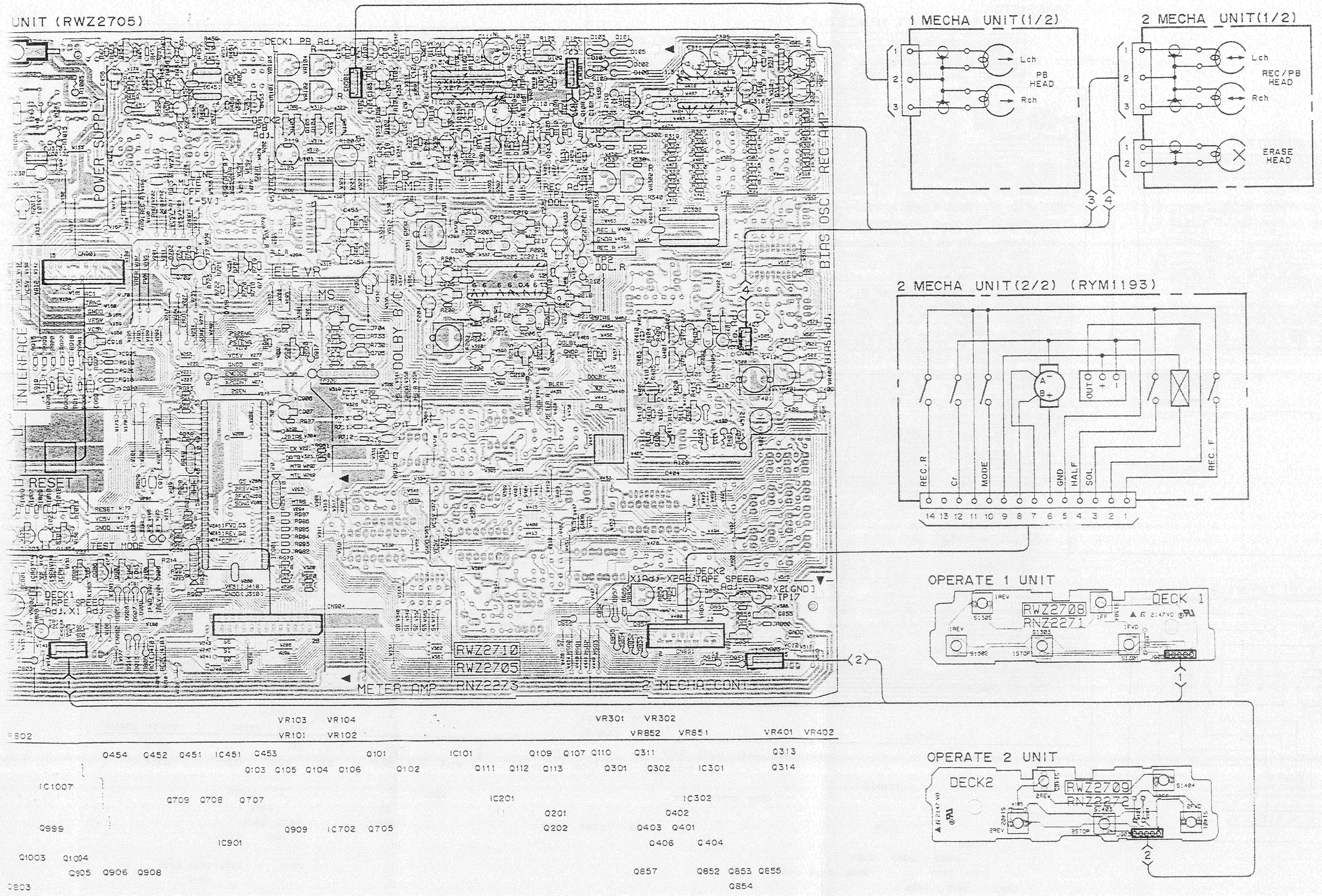
1. Unspecified NPN transistors are 2SC3311A.
2. Unspecified PNP transistors are 2SA1309A.
3. Unspecified diodcs ars 1SS245.
4. Unspecified capacitors ars CFTXA.
5. Unspecified semi-fixed resistors ars TB.

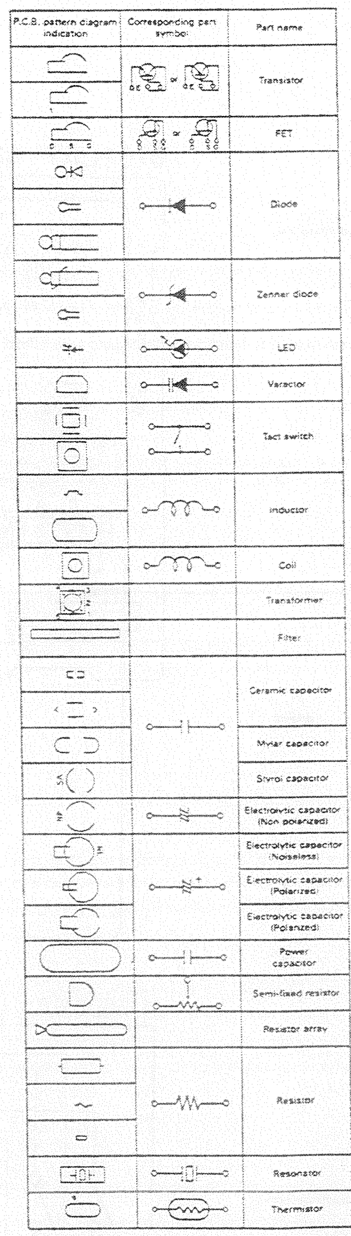
———— :PLAYBACK SIGNAL

– – – – :RECORDING SIGNAL

- View from component side

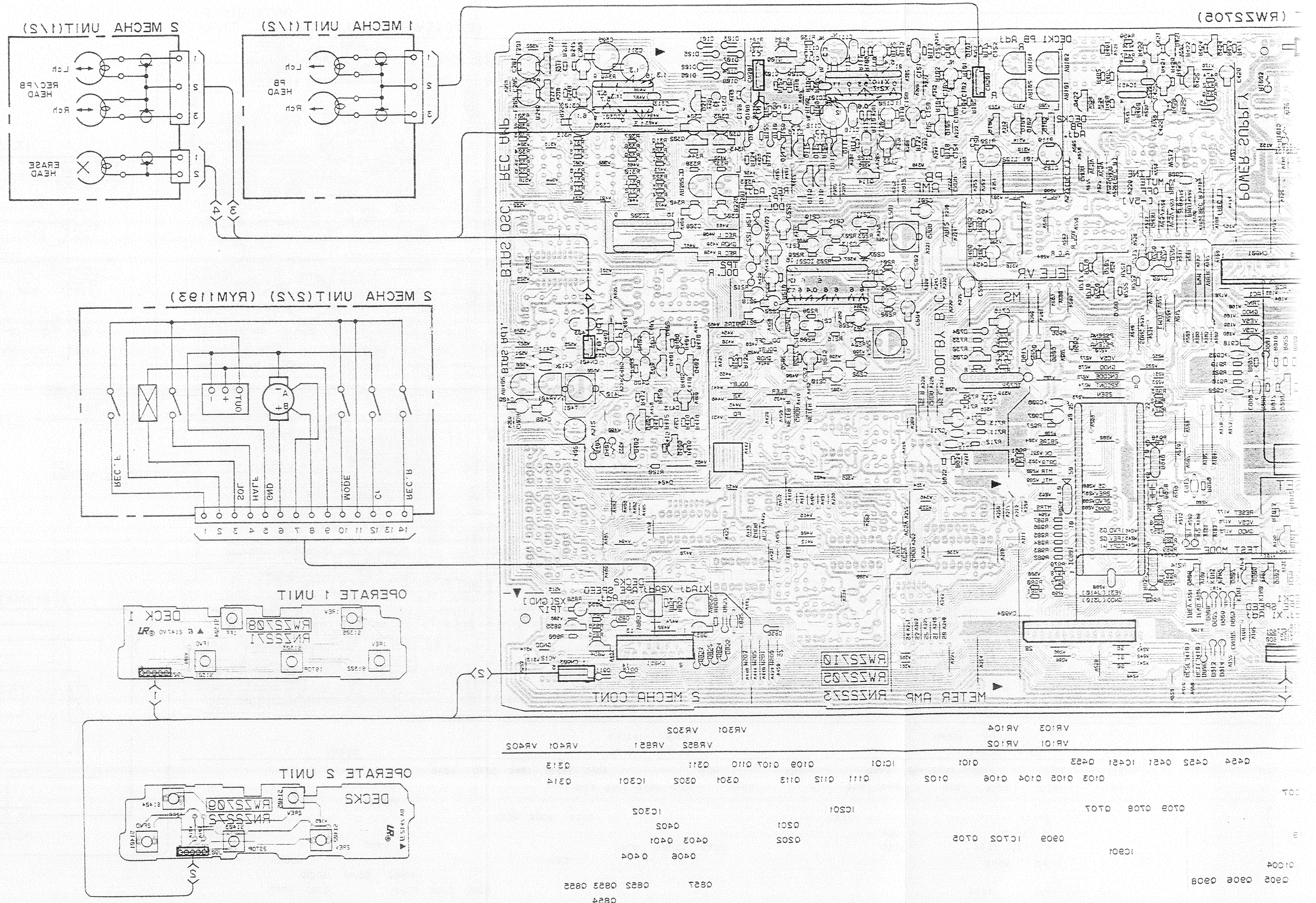

1
2
3
4
5
6
A
B
C
D
TRANSISTOR UNIT
MAIN UNIT (RWZ2705)
DISPLAY UNIT (RWZ2707)
RWZ2707
RNZ2270
S1206
REV MODE
S1202
HIGH
NORM
S1203
S1201
S1204
MUTE
S1205
PAUSE
REC
S1208
DOLBY-NR
B
OFF
C
TO AMPLIFIER
POWER SUPPLY
INTERFACE
RESET
TEST MODE
MUTING OFF (-5V)
TELE VR
MS
DOLBY B/C
PB AMP
DECK1 PB Adj
DECK2
REC AMP
BIAS OSC
BIAS Adj
REC Adj
TP2 DOL R
DECK1 TAPE SPEED Adj X1 Adj
DECK2 TAPE SPEED Adj
X1 Adj
X2 Adj
X2 (GND)
TP17
CN904
RWZ2710
RWZ2705
1 MECHA CONT
METER AMP RNZ2273
2 MECHA CONT
1 MECHA UNIT (2/2) (RYM1191)
Cr
MODE
GND
HALF
SOL
OUT
12
11
10
9
8
7
6
5
4
3
2
1
1 ME
2 MEC
REC R
(2)
VR802
VR103
VR104
VR101
VR102
VR301
VR302
VR852
VR851
VR401
VR402
Q454
Q452
Q451
IC451
Q453
Q101
IC101
Q109
Q107
Q110
Q311
Q313
Q103
Q105
Q104
Q106
Q102
Q111
Q112
IC113
Q301
Q302
IC301
Q314
IC1007
Q709
Q708
Q707
IC201
IC302
IC1003
Q201
Q402
Q202
Q403
Q401
Q999
Q909
IC702
Q705
IC1005
IC901
Q406
Q404
Q1002
Q1003
Q1004
Q804
Q805
Q905
Q906
Q908
Q857
Q852
Q853
Q855
Q854
Q807
Q802
Q803


UNIT (RWZ2705)
POWER SUPPLY
INTERFACE
RESET
TEST MODE
DECK1 PB Adj
PB AMP
REC AMP
BIAS OSC
BIAS Adj
DOLBY B/C
TELE VR
MS
DECK1 TAPE SPEED Adj. X1 Adj
X1Adj X2Adj
DECK2 TAPE SPEED Adj
X2(GND)
TP17
RWZ2710
RWZ2705
METER AMP
RNZ2273
2 MECHA CONT
1 MECHA UNIT(1/2)
Lch
PB HEAD
Rch
2 MECHA UNIT(1/2)
Lch
REC/PB HEAD
Rch
ERASE HEAD
2 MECHA UNIT(2/2) (RYM1193)
REC.R
Cr
MODE
GND
HALF
SOL
REC.F
14 13 12 11 10 9 8 7 6 5 4 3 2 1
OPERATE 1 UNIT
DECK 1
RWZ2708
RNZ2271
OPERATE 2 UNIT
DECK2
RWZ2709
RNZ2272
VR103 VR104
VR101 VR102
VR301 VR302
VR852 VR851
VR401 VR402
Q454 Q452 Q451 IC451 Q453
Q103 Q105 Q104 Q106
Q101 Q102
IC101
Q109 Q107 Q110 Q311
Q111 Q112 Q113
Q301 Q302 IC301
Q313 Q314
IC1007
Q709 Q708 Q707
IC201
IC302
Q201 Q202
Q402 Q403 Q401 Q406 Q404
Q999
Q909 IC702 Q705
IC901
Q1003 Q1004
Q905 Q906 Q908
Q857 Q852 Q853 Q855 Q854

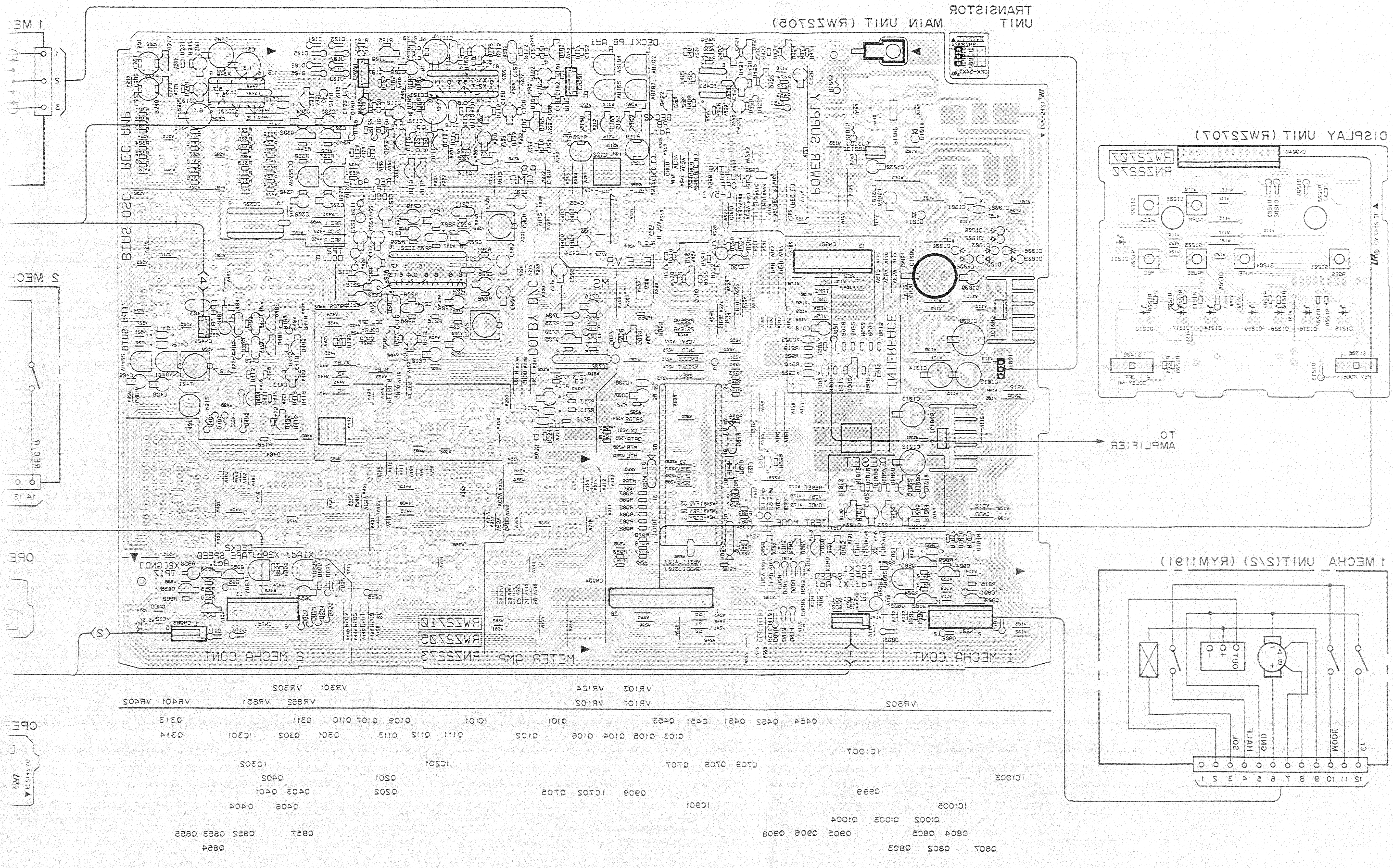


| P.C.B. pattern diagram indication | Corresponding part symbol | Part name |
|---|---|---|
| | | Transistor |
| | | FET |
| | | Diode |
| | | Zenner diode |
| | | LED |
| | | Varactor |
| | | Tact switch |
| | | Inductor |
| | | Coil |
| | | Transformer |
| | | Filter |
| | | Ceramic capacitor |
| | | Mylar capacitor |
| | | Styrol capacitor |
| | | Electrolytic capacitor (Non polarized) |
| | | Electrolytic capacitor (Noiseless) |
| | | Electrolytic capacitor (Polarized) |
| | | Electrolytic capacitor (Polarized) |
| | | Power capacitor |
| | | Semi-fixed resistor |
| | | Resistor array |
| | | Resistor |
| | | Resonator |
| | | Thermistor |

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

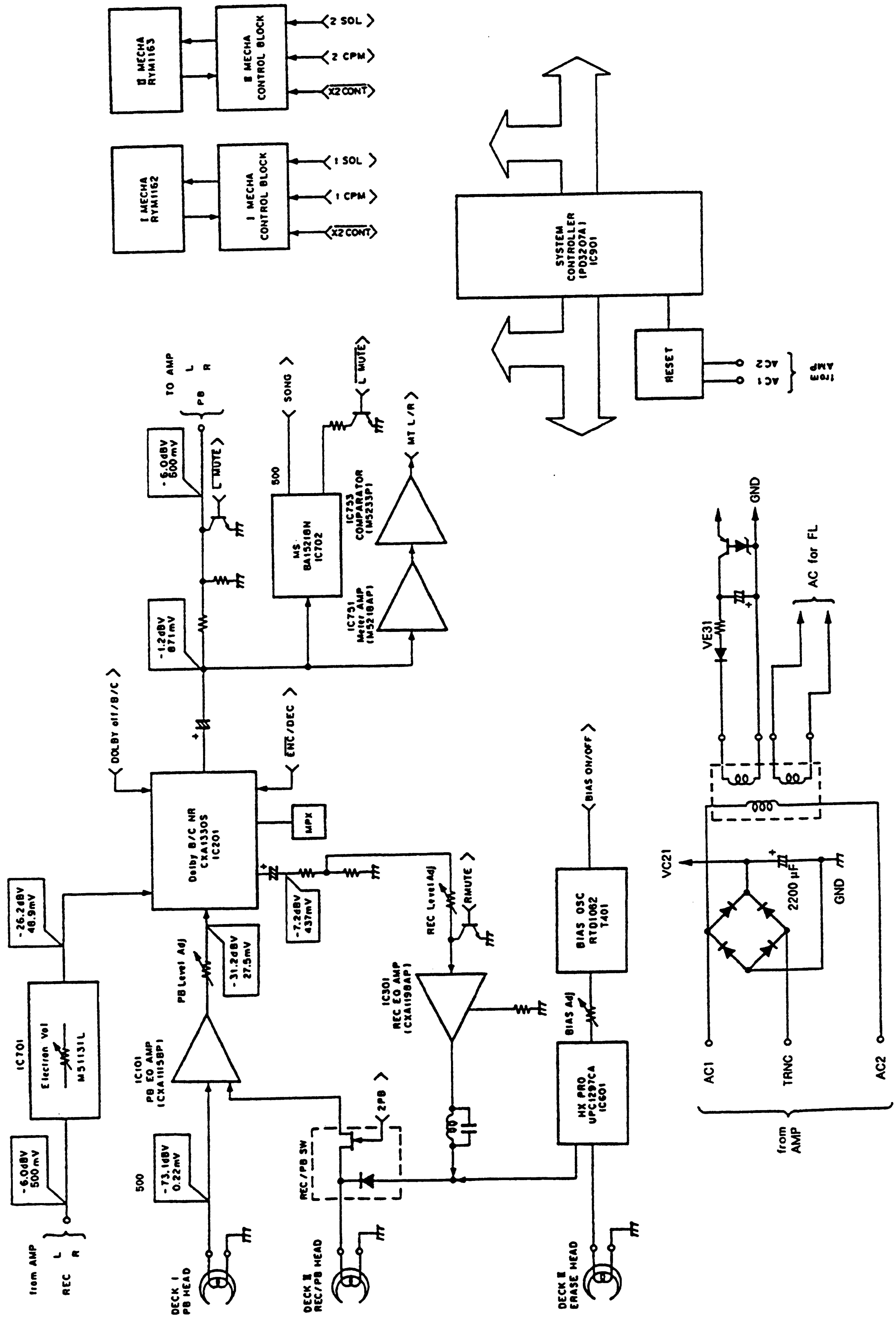

2 MECHA UNIT(1/2)
1 MECHA UNIT(1/2)
REC/PB HEAD
PB HEAD
ERASE HEAD
Lch
Rch
2 MECHA UNIT(2/2) (RYM1193)
REC F
SOL
HALF
GND
MODE
CI
REC R
OPERATE 1 UNIT
DECK 1
RWZ2708
RNZ2271
OPERATE 2 UNIT
DECK2
RWZ2709
RNZ2272
(RWZ2705)
DECK1 PB AMP
POWER SUPPLY
REC AMP
BIAS OSC
DOLBY B/C
ELE VR
TEST MODE
2 MECHA CONT
RWZ2710
RWZ2705
RNZ2273
METER AMP
VR101
VR102
VR103
VR104
VR301
VR302
VR401
VR402
VR851
VR852
IC101
IC301
IC302
IC201
IC451
IC501
IC702
Q101
Q102
Q103
Q104
Q105
Q106
Q107
Q108
Q110
Q111
Q112
Q113
Q301
Q302
Q311
Q313
Q314
Q401
Q402
Q403
Q404
Q406
Q451
Q452
Q453
Q454
Q201
Q202
Q705
Q707
Q708
Q709
Q852
Q853
Q854
Q855
Q857
Q903
Q904
Q905
Q906
Q908

- View from soldering side

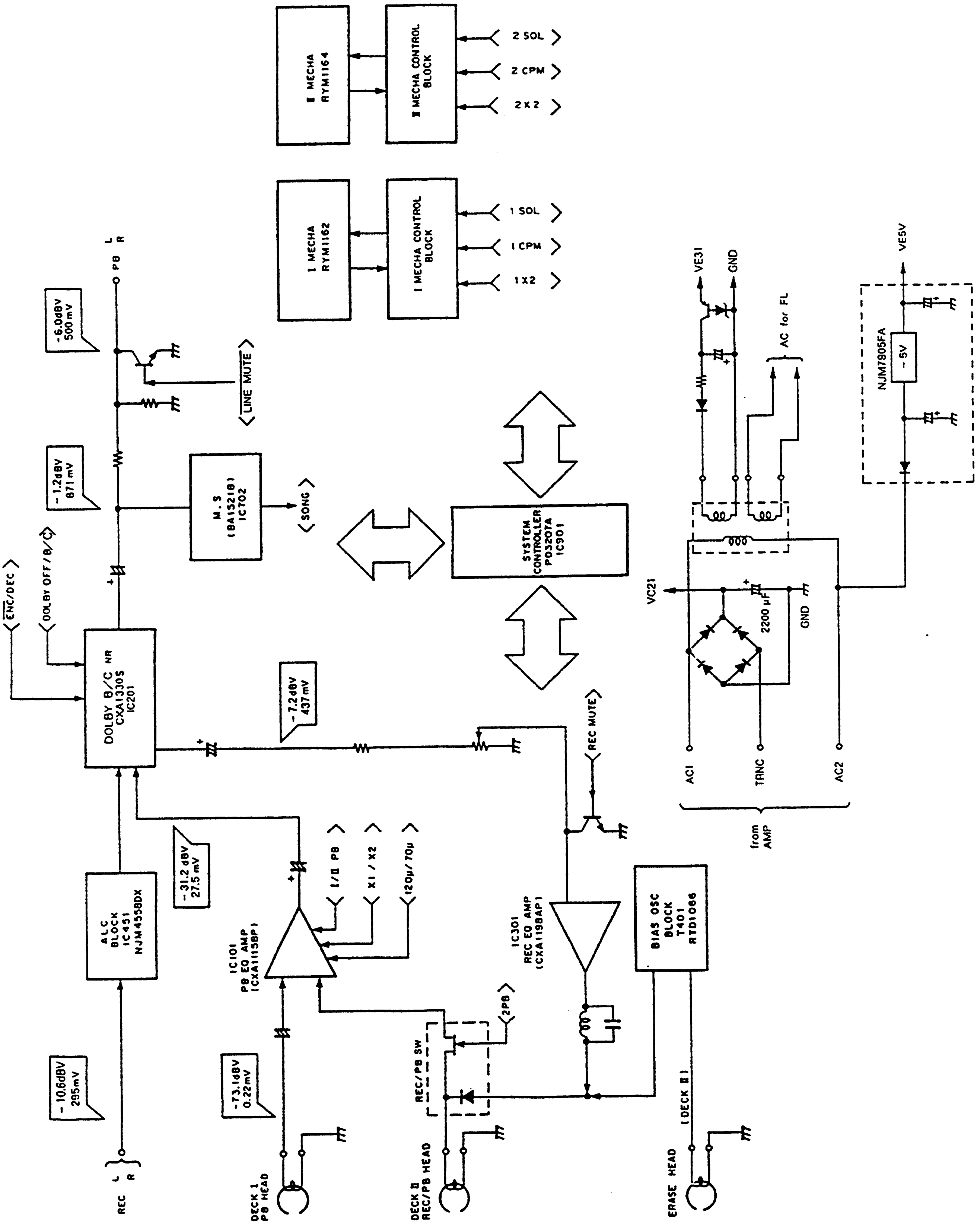

TRANSISTOR UNIT
MAIN UNIT (RWZ2705)
DISPLAY UNIT (RWZ2707)
RWZ2707
RNZ2270
TO AMPLIFIER
1 MECHA UNIT(2/2) (RYM1191)
1 MECHA
2 MECHA
REC AMP
BIAS OSC
BIAS AMP
DOLBY B/C
POWER SUPPLY
INTERFACE
RESET
TEST MODE
LEVEL VR
MS
DECK1 PB Adj
DECK2
LINE
2 MECHA CONT
METER AMP
1 MECHA CONT
RWZ2710
RWZ2705
RNZ2273
DECK2 TAPE SPEED Adj
DECK1 TAPE SPEED Adj
HIGH
NORM
REC
PAUSE
MUTE
RMS
REV MODE
SOL
HALF
GND
MODE
A
B
C
D
1
2
3
4
5
6

# 4. BLOCK DIAGRAM

## 4.1 FOR CT–J410WR


II MECHA
RYM1163
II MECHA
CONTROL BLOCK
2 SOL
2 CPM
X2 CONT
I MECHA
RYM1162
I MECHA
CONTROL BLOCK
1 SOL
1 CPM
X2 CONT
SYSTEM
CONTROLLER
(PD3207A)
IC901
RESET
AC2
AC1
from
AMP
TO AMP
L
R
PB
-6.0dBV
500mV
L MUTE
SONG
500
MS
BA15218N
IC702
L MUTE
MT L/R
IC753
COMPARATOR
(M5233P)
IC751
Meter AMP
(M5218AP)
-1.2dBV
871mV
DOLBY off/B/C
ENC/DEC
Dolby B/C NR
CXA1330S
IC201
MPX
-7.2dBV
437mV
REC Level Adj
R MUTE
-26.2dBV
48.9mV
IC701
Electron Vol
M5113IL
-6.0dBV
500mV
from AMP
REC
L
R
PB Level Adj
-31.2dBV
27.5mV
IC101
PB EQ AMP
(CXA1115BP)
500
-73.1dBV
0.22mV
DECK I
PB HEAD
2PB
REC/PB SW
DECK II
REC/PB HEAD
IC301
REC EQ AMP
(CXA1198AP)
BIAS ON/OFF
BIAS OSC
RT01062
T401
BIAS Adj
HX PRO
UPC1297CA
IC601
DECK II
ERASE HEAD
GND
VE31
AC for FL
VC21
2200 µF
GND
AC1
TRNC
AC2
from
AMP

## 4.2 FOR CT-J310WR


II MECHA
RYM1164
II MECHA CONTROL BLOCK
2 SOL
2 CPM
2x2
I MECHA
RYM1162
I MECHA CONTROL BLOCK
1 SOL
1 CPM
1x2
PB L R
-6.0dBV 500mV
LINE MUTE
-1.2dBV 871mV
M.S (BA15218) IC702
SONG
SYSTEM CONTROLLER PD3207A IC901
ENC/DEC
DOLBY OFF/B/C
DOLBY B/C NR CXA1330S IC201
-7.2dBV 437mV
REC MUTE
ALC BLOCK IC451 NJM4558DX
-31.2dBV 27.5mV
I/II PB
X1/X2
120μ/70μ
IC101 PB EQ AMP (CXA1115BP)
IC301 REC EQ AMP (CXA1198AP)
BIAS OSC BLOCK T401 RTD1066
-10.6dBV 295mV
REC L R
-73.1dBV 0.22mV
DECK I PB HEAD
DECK II REC/PB HEAD
REC/PB SW
2PB
(DECK II)
ERASE HEAD
VE31
GND
AC for FL
VE5V
NJM7905FA
-5V
VC21
2200μF
GND
AC1
TRNC
AC2
from AMP

# 5. PCB PARTS LIST

**NOTES:**

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω → $56 \times 10^1$ → 561 ································ RD1/8PM$\boxed{5}\boxed{6}\boxed{1}$J
47k Ω → $47 \times 10^3$ → 473 ································ RD1/4PS$\boxed{4}\boxed{7}\boxed{3}$J
0.5 Ω → 0R5 ········································ RN2H$\boxed{0}\boxed{R}\boxed{5}$K
1 Ω → 010 ········································ RS1P$\boxed{0}\boxed{1}\boxed{0}$K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → $562 \times 10^1$ → 5621 ······························ RN1/4PC$\boxed{5}\boxed{6}\boxed{2}\boxed{1}$F

## LIST OF ASSEMBLIES

| Mark | No. | Description | Part No. |
|---|---|---|---|
|  |  | MAIN UNIT | RWZ2710 (CT-J410WR) |
|  |  |  | RWZ2705 (CT-J310WR) |
| NSP |  | TRANSISTOR UNIT | RWZ2711 |
|  |  | DISPLAY UNIT | RWZ2712 (CT-J410WR) |
|  |  |  | RWZ2707 (CT-J310WR) |
| NSP |  | OPERATE 1 UNIT | RWZ2713 (CT-J410WR) |
| NSP |  |  | RWZ2708 (CT-J310WR) |
| NSP |  | OPERATE 2 UNIT | RWZ2714 (CT-J410WR) |
| NSP |  |  | RWZ2709 (CT-J310WR) |

## MAIN UNIT (CT-J410WR)

### SEMICONDUCTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
|  | IC702 |  | BA15218N |
|  | IC101 |  | CXA1115BP |
|  | IC301 |  | CXA1198AP |
|  | IC201 |  | CXA1330S |
|  | IC701 |  | M51131L |
|  | IC751 |  | M5218AP |
|  | IC753 |  | M5233P |
| ⚠ | IC1005 |  | NJM7812FA |
| ⚠ | IC1003 |  | NJM78M05FA |
|  | IC901 |  | PD3207A |
|  | IC752 |  | TC4050BP |
|  | IC302 |  | TC4051BP |
|  | IC601 |  | UPC1297CA |
|  | Q1001 |  | 2SA1283 |
|  | Q601, Q602, Q802, Q852, Q1002 |  | 2SA1309A |
|  | Q404, Q804, Q854 |  | 2SB1238X |
|  | Q401–Q403 |  | 2SC1815 |
|  | Q109, Q110, Q301, Q302, Q405–Q407, Q702, Q703, Q999, Q1003, Q1004 |  | 2SC3311A |
|  | Q807, Q857 |  | 2SD1858X |
|  | Q707, Q708 |  | 2SD2144S |
|  | Q107, Q108 |  | 2SK373 |
|  | Q313, Q314, Q758 |  | DTC114TS |
|  | Q705 |  | DTC124TS |
|  | Q115, Q311, Q709 |  | XDA124ES |
|  | Q103–Q106, Q704, Q757, Q905–Q908 |  | XDC114ES |
|  | Q101, Q102, Q111–Q114, Q116, Q201, Q604, Q701, Q803, Q805, Q853, Q855, Q909 |  | XDC124ES |
| ⚠ | D312, D1001–D1008, D1011 |  | 1SR35-100AVL |
|  | D401, D801, D807, D851 |  | 1SS252 |
|  | D101–D112, D405, D601, D602, D702–D704, D751–D758, D802, D803, D806, D852–D857, D901, D905–D908, D910, D911, D913, D914, D917, D1012 |  | 1SS254 |
| ⚠ | D1009 |  | MTZJ27B |
| ⚠ | D1010, D1013 |  | MTZJ5. 1B |

### COILS, TRANSFORMERS AND FILTERS

| Mark | No. | Description | Part No. |
|---|---|---|---|
|  | L402 |  | LFA121K |
|  | L601, L602 | (L=4. 6MH, Q=25, F=105KH) | RTD1053 |
|  | L401 |  | RTD1062 |
|  | L301, L302 | (L=10MH(79. 6KHZ), Q=25) | RTF1004 |
|  | L101, L102 | (L=5. 6MH(252KHZ), Q=30) | RTF1022 |
|  | F201, F202 |  | RTF1062 |
| ⚠ | T1001 |  | RTT1220 |

### CAPACITORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
|  | C609, C610 |  | CCCSL101K500 |
|  | C131, C132 |  | CCPUSL100J50 |
|  | C107–110 |  | CEANL100M16 |
|  | C111–C112 |  | CEANL101M10 |
|  | C201, C202, C207, C208, C453, C454, C755, C756 |  | CEAS010M50 |
|  | C205, C206, C223, C224, C615, C617, C701, C702, C918, C1022 |  | CEAS100M50 |
|  | C1012, C1014 |  | CEAS101M25 |
|  | C1017, C1019 |  | CEAS101M50 |
|  | C1008 |  | CEAS102M25 |
|  | C1009 |  | CEAS221M10 |
|  | C1013, C1015 |  | CEAS221M16 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | C1006 | | CEAS222M25 |
| | C203, C204, C309, C310 | | CEAS2R2M50 |
| | C221, C222 | | CEAS330M16 |
| | C311 | | CEAS331M16 |
| | C129, C130, C225, C408–C410, C703, C704, C706, C753, C754, C907, C1025 | | CEAS470M16 |
| | C1018 | | CEAS470M50 |
| | C305, C306 | | CEAS471M10 |
| | C119, C120, C209, C210, C303, C304, C616, C705, C1023 | | CEAS4R7M50 |
| | C217, C218, C716 | | CEASR22M50 |
| | C215, C216, C219, C220 | | CEASR33M50 |
| | C307, C308, C714, C757, C758 | | CEASR47M50 |
| | C601, C602 | | CFTXA103J50 |
| | C211–C214 | | CFTXA222J50 |
| | C121, C122, C404, C605, C606 | | CFTXA223J50 |
| | C405–C407 | | CFTXA332J50 |
| | C117, C118 | | CFTXA822J50 |
| | C133, C711, C712 | | CGCYX104K25 |
| | C614 | | CGCYX104M25 |
| | C607, C608, C760, C801, C1001, C1002 | | CGCYX473K25 |
| | C751, C752 | | CGCYX683K25 |
| | C725, C726, C905, C919, C920, C999 | | CKCYB102K50 |
| | C707–C709 | | CKCKY103Z50 |
| | C710, C717, C906, C908, C917, C1026–C1028 | | CKCYF103Z50 |
| | C313, C759, C1020, C1021 | | CKCYF473Z50 |
| | C113–C116, C613, C713 | | CKPUYB101K50 |
| | C105, C106 | | CKPUYB102K50 |
| | C301, C302 | | CKPUYB221K50 |
| | C715 | | CKPUYB271K50 |
| | C103, C104, C125, C126 | | CKPUYB391K50 |
| | C123, C124 | | CKPUYB471K50 |
| | C101, C102 | | CKPUYB561K50 |
| | C127, C128, C802, C852 | | CKPUYB681K50 |
| | C603, C604 | | CKPUYB821K50 |
| | C403 | | CQPA752J100 |
| | C611, C612 | (C=430P, V(DC)=500) | RCG1005 |

### RESISTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | R949, R954 | (R=22K, W=1, A=J) | RA4T223J |
| | R932 | | RA5T104J |
| | R763 | (R=22K, W=1, A=J) | RA5T223J |
| | R211, R212 | (R=4. 7K, W=1/6, A=J) | RCN1028 |
| | R404 | (R=5R6, W=1/2, A=J) | RCN1033 |
| | R1015 | (R=2700, W=1/2, A=J) | RCN1046 |
| | R407 | (R=560, W=1/2, A=J) | RCN1061 |
| | R1003 | (R=562, W=1/2, A=J) | RCN1062 |
| | R422 | (R=9R1, W=1/4, A=J) | RCN1063 |
| | VR851 | (R=10K, W=0. 1) | RCP1045 |
| | VR101–VR104, VR301, VR302, VR601, VR602 | (R=22K, W=0. 1) | RCP1046 |
| | VR802, VR852 | (R=15K, W=0. 1) | RCP1090 |
| | R765 | (R=11K/22K, N=10) | RCX1020 |
| | R401 | | RD1/2LF☐☐☐J |
| ⚠ | R1001 | (R=47, W=1/4, A=J) | RFA1/4L☐☐☐J |
| | R1002 | (R=1. 5K, W=1, A=J) | RS1LMF☐☐☐J |
| | OTHER RESISTORS | | RD1/6PM☐☐☐J |

### OTHERS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | CN904 | FFC CONNECTOR 30P | 52045-3045 |
| | CN801 | CONNECTOR 12P | KPE12 |
| | CN851 | CONNECTOR 14P | KPE14 |
| | X901 | CERAMIC RESONATOR(4. 19MHz) | VSS1014 |

## MAIN UNIT (CT-J310WR)

### SEMICONDUCTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | IC702 | | BA15218N |
| | IC101 | | CXA1115BP |
| | IC301 | | CXA1198AP |
| | IC201 | | CXA1330S |
| | IC451 | | NJM4558DX |
| ⚠ | IC1005 | | NJM7812FA |
| ⚠ | IC1003 | | NJM78M05FA |
| ⚠ | IC1007 | | NJM7905FA |
| | IC901 | | PD3207A |
| | IC302 | | TC4051BP |
| | Q802, Q852, Q1002 | | 2SA1309A |
| | Q404, Q804, Q854 | | 2SB1238X |
| | Q453, Q454 | | 2SC1740SLN |
| | Q109, Q110, Q301, Q302, Q406, Q451, Q452,, Q999, Q1003, Q1004 | | 2SC3311A |
| | Q401, Q402 | | 2SD1302 |
| | Q807, Q857 | | 2SD1858X |
| | Q403, Q707, Q708 | | 2SD2144S |
| | Q107, Q108 | | 2SK373 |
| | Q313, Q314 | | DTC114TS |
| | Q705 | | DTC124TS |
| | Q115, Q311, Q709 | | XDA124ES |
| | Q103–Q106, Q905–Q908 | | XDC114ES |
| | Q101, Q102, Q111–Q114, Q116, Q201, Q803, Q805, Q853, Q855, Q909 | | XDC124ES |
| ⚠ | D312, D1001–D1005, D1007, D1008, D1014 | | 1SR35-100AVL |
| | D801, D807, D851 | | 1SS252 |
| | D101–D112, D401, D404, D405, D451, D452, D702–D704, D802, D803, D806, D852–D857, D901, D905–D908, D910, D911, D913, D914, D917, D1012 | | 1SS254 |

### COILS, TORANSFORMERS AND FILTERS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | T401 | | ATX-043 |
| | L402 | | LFA121K |
| | L301, L302 | (10MH(79. 6KHZ), Q=25) | RTF1004 |
| | L101, L102 | (5. 6MH(252KHZ), Q=30) | RTF1022 |
| | F201, F202 | | RTF1062 |

### CAPACITORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | C411, C412 | | CCCSL101K500 |
| | C131, C132 | | CCPUSL100J50 |
| | C107–C110 | | CEANL100M16 |
| | C111, C112 | | CEANL101M10 |
| | C201, C202, C207, C208, C451, C452 | | CEAS010M50 |
| | C205, C206, C223, C224, C453–C455, C918, C1022, C1030 | | CEAS100M50 |
| | C1012, C1014 | | CEAS101M25 |
| | C1029 | | CEAS101M50 |
| | C1008 | | CEAS102M25 |
| | C1009 | | CEAS221M10 |
| | C1013, C1015 | | CEAS221M16 |
| | C1006 | | CEAS222M25 |
| | C203, C204, C309, C310 | | CEAS2R2M50 |
| | C221, C222 | | CEAS330M16 |
| | C311 | | CEAS331M16 |
| | C129, C130, C225, C408–C410, C907 | | CEAS470M16 |
| | C305, C306 | | CEAS471M10 |
| | C119, C120, C209, C210, C303, C304, C1023 | | CEAS4R7M50 |
| | C217, C218, C716 | | CEASR22M50 |
| | C215, C216, C219, C220, C456 | | CEASR33M50 |
| | C714 | | CEASR47M50 |
| | C307, C308 | | CEASR68M50 |
| | C406, C407 | | CFTXA103J50 |
| | C404 | | CFTXA123J50 |
| | C405 | | CFTXA153J50 |
| | C211–C214 | | CFTXA222J50 |
| | C121, C122 | | CFTXA223J50 |
| | C117, C118 | | CFTXA822J50 |
| | C133, C711, C712 | | CGCYX104K25 |
| | C801, C1001, C1002 | | CGCYX473K25 |
| | C905, C919, C920, C999 | | CKCYB102K50 |
| | C717, C906, C908, C917 | | CKCYF103Z50 |
| | C313 | | CKCYF473Z50 |
| | C113–C116, C713 | | CKPUYB101K50 |
| | C105, C106 | | CKPUYB102K50 |
| | C301, C302, C413 | | CKPUYB221K50 |
| | C715 | | CKPUYB271K50 |
| | C103, C104, C125, C126 | | CKPUYB391K50 |
| | C123, C124 | | CKPUYB471K50 |
| | C101, C102 | | CKPUYB561K50 |
| | C127, C128, C802, C852 | | CKPUYB681K50 |
| | C403 | | CQPA162J100 |

### RESISTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | R949, R954 | (R=22K, W=1, A=J) | RA4T223J |
| | R932 | (R=100K, W=1, A=J) | RA5T104J |
| | R408 | (R=120, W=1/2, A=J) | PRCN1020 |
| | R404 | (R=4. 7, W=1/2, A=J) | PRCN1022 |
| | R407 | (R=160, W=1/2, A=J) | PRCN1026 |
| | R211, R212 | (R=4. 7K, W=1/6, A=J) | RCN1028 |
| | VR851 | (R=10K, W=0. 1) | RCP1045 |
| | VR101–VR104, VR301, VR302 | (R=22K, W= 0. 1) | RCP1046 |
| | VR401, VR402 | (R=220K, W=0. 1) | RCP1049 |
| | VR802, VR852 | (R=15K, W=0. 1) | RCP1090 |
| | R401 | | RD1/2LF010J |
| | OTHER RESISTORS | | RD1/6PM☐☐☐J |

### OTHERS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | CN904 | FFC CONNECTOR 28P | 52045-2845 |
| | CN801 | CONNECTOR 12P | KPE12 |
| | CN851 | CONNECTOR 14P | KPE14 |
| | X901 | CERAMIC RESONATOR(4. 19MHz) | VSS1014 |

## TRANSISTOR UNIT

### SEMICONDUCTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| ⚠ | IC1006 | | NJM7812FA |

## DISPLAY UNIT (CT-J410WR)

### SEMICONDUCTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | D1201–D1207, D1303 | | 1SS254 |
| | D1211 | | SEL6C10R |

### SWITCHES

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | S1201–S1206, S1208, S1209 | | RSG1033 |
| | S1211, S1212 | | RSH1041 |

### RESISTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | VR1201 | (R=100KB, P=0. 05W) | RCW1009 |
| | OTHER RESISTORS | | RD1/6PM☐☐☐J |

### OTHERS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | CN9040 | FFC CONNECTOR 30P | 52045-3045 |
| | V1201 | | RAW1097 |
| | FL HOLDER | | RNK1755 |

## DISPLAY UNIT (CT-J310WR)

### SEMICONDUCTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | D1201–D1203, D1205, D1206, D1213 | | 1SS254 |
| | D1215–D1218 | | SEL6410E |
| | D1211, D1214, D1219, D1220 | | SEL6C10R |

### SWITCHES

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | S1201–S1206 | | RSG1033 |
| | S1306, S1406 | | RSH1041 |

### RESISTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | ALL RESISTORS | | RD1/6PM☐☐☐J |

### OTHERS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | CN9040 | FFC CONNECTOR 28P | 52045-2845 |

## OPERATE 1 UNIT

### SEMICONDUCTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | D1301, D1302 | | SEL6410E<br>(CT-J410WR only) |

### SWITCHES

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | S1301–S1305 | | RSG1033 |

### RESISTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | R1301, R1302 | | RD1/6PM☐☐☐J<br>(CT-J410WR only) |

## OPERATE 2 UNIT

### SEMICONDUCTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | D1401, D1402 | | SEL6410E<br>(CT-J410WR only) |

### RESISTORS

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | R1401, R1402 | | RD1/6PM☐☐☐J<br>(CT-J410WR only) |

### SWITCHES

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | S1401–S1405 | | RSG1033 |

# 6. ADJUSTMENTS

## 6.1 MECHANICAL ADJUSTMENT

These adjustments must be performed in TEST MODE
- Entering the TEST MODE
  Set the Reverse Mode Switch to ⊂⊃ , and short the TEST MODE jumper wire.
- Releasing the TEST MODE
  Press the STOP keys of DECKs I and II simultaneously.

1. Tape Speed Adjustment and Check

| No. | Deck | Mode | Test tape | Adjusting points | Specifications/Ratings (playback frequency) | Remarks |
|---|---|---|---|---|---|---|
| 1 | I | Normal speed PLAY | STD-301<br>(3 kHz) | | Play back for 1 minute and then press the FF or REW key. *1 | |
| 2 | | Double speed PLAY | | check | 6000 Hz ± 600 Hz (Pins ⑫ and ⑬ of CN901) | |
| 3 | | Normal speed PLAY | | | Press the FF or REW key after checking. | |
| 4 | II | | | | Play back for 1 minute and then press the FF or REW key. *1 | |
| 5 | | Double speed PLAY | | VR851 | Within ± 10 Hz of step 2 (deck I) check value. (CN901 −⑫, ⑬) | |
| 6 | | Normal speed PLAY | | | Press the FF or REW key after checking. | |
| 7 | | | | VR852 | 3020 Hz ± 5 Hz (Pins ⑫ and ⑬ of CN901) | |
| 8 | I | | | VR802 | Within ± 5 Hz of step 7 (deck II) adjustment value. | |

*1: If the FF or REW key is pressed during PLAY, double speed mode is selected.

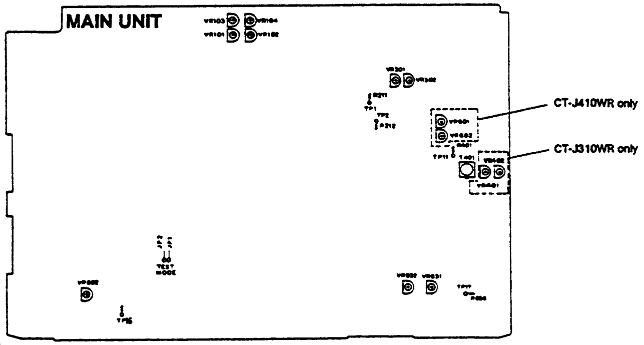


Fig. 6–1 Adjusting points

● **Door damping check and adjustment**

1. When assembling the front panel attach the door spring to the position (a) according to fig. 6–2, and stand the front panel assembly straight up as shown in fig. 6–3.
2. Open the doors of DECK I and DECK II simultaneously, and when one of the doors is fully opend, confirm that the disparity between the two doors is within 15 mm.
3. If the specification described in [illegible] is not satisfied, change the door spring position as follows and ac

- When the door of DECK I opens slower than the one of DECK II: Change the DECK I door spring to position (b).
- When the door of DECK I opens faster than the one of DECK II: Change the DECK II door spring to position (b).
  (Basically adjust the door which opens slower to the faster one.)

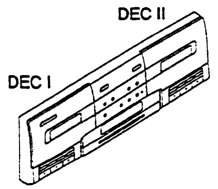


Fig. 6–2

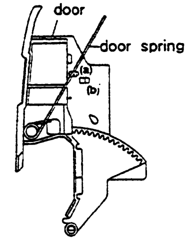


Fig. 6–3

## 6.2 ELECTRICAL ADJUSTMENTS

### Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Turn power on allow the deck to warm up for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0 dBV=1 Vrms.
5. Connect a 50 kΩ (or between 47k to 52 kΩ ) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

### Test Tapes

| | |
|---|---|
| STD–331E | : Playback adjustments (See Fig. 6–4) |
| STD–631 | : NORMAL blank tape |
| STD–621 | : CrO2 blank tape |
| STD–610 | : METAL blank tape |

※ As the reference recording level is 250 nwb/m for STD–331E, the recording level will be higher by 4 dB for STD–331B (160 nwb/m). When adjusting, pay carefull attention to the type of tape used.

### List of Adjustments

**Playback sections**
1. Head azimuth adjustment.
2. Playback level adjustment.

**Recording sections**
1. Bias oscillator adjustment.
2. Recording bias adjustment.
3. Recording level adjustment.

NOTE: This unit has an automatic tape selection feature.

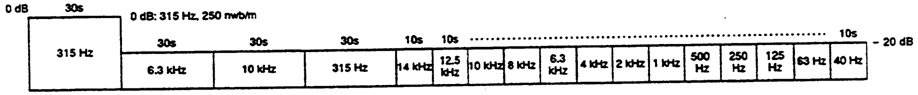


Fig. 6–4 Constants of the test tape STD–331E

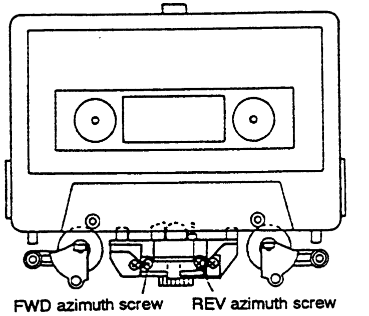


Fig. 6–5 Head azimuth adjustment

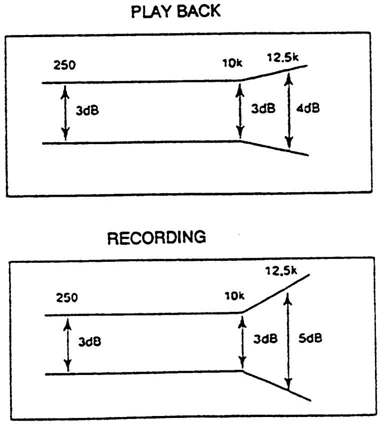


Fig. 6–6 Frequency response zone

## PLAYBACK SECTION

### 1. Head Azimuth Adjustment

- Turn VR103, VR104 (Deck I) or VR101, VR102 (Deck II) to mechanical center positions.

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | PLAY | Play the 10 kHz/–20 dB section of STD–331E test tape. | Head azimuth adjustment screw.<br>(See Fig. 6–5) | Pins ⑫ and ⑬ of CN901 | Maximum playback signal level. | |
| 2. | STOP | Lock the screw with screw lock after completing adjustment. | | | | |

### 2. Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | PLAY | Play the 315 Hz/0 dB section of the STD–331E test tape. | Deck I | VR103 (Lch)<br>VR104 (Rch) | TP. 1 (Lch)<br>TP. 2 (Rch) | –6.7 dBV<br>(CT–J410WR/J310WR) | |
| | | | Deck II | VR101 (Lch)<br>VR102 (Rch) | | | |

## RECORDING SECTION

### 1. Bias Oscillator Frequency Adjustment (CT-J410WR)

- Adjust the bias oscillator with checks set to recording mode simultaneously. ← (Double R/P only)

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | REC | Load the STD–610 test tape with no input signal. | Deck II | T401 | TP. 11 | 105 ± 0.3 kHz | |

### 2. Recording Bias Adjustment

- Adjust the bias oscillator with decks I and II set to recording mode independently. ← (Double R/P only)
- After the adjustment, caution should be exercised so as not to become under bias by checking the distortion rate.

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | STOP | Set the TAPE SELECTOR switch to the NORM position. | | | | | |
| 2. | REC | Record the 315 Hz and 6.3 kHz signals at –20 dB input level and playback. | Deck II | VR601 (Lch)<br>VR602 (Rch)<br>(CT–J410WR)<br>VR401 (Lch)<br>VR402 (Rch)<br>(CT–J310WR) | Pins ⑫ and ⑬ of CN901 | Repeatedly record, playback and adjust so that the plyaback level of 6.3 kHz signal becomes +0.5 dB ± 0.5 dB when compared with the 315 Hz signal. | |

### 3. Recording Level Adjustment

- Adjust the bias oscillator with decks I and II set to recording mode independently. ← (Double R/P only)

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | STOP | Set the TAPE SELECTOR switch to the NORM position. | | | | | |
| 2. | REC/<br>PAUSE | Apply a 315 Hz/–4 dB signal to the line input terminals, load the STD–631 test tape. | REC level control volume | | TP. 1 (Lch)<br>TP. 2 (Rch) | –11.2 dBV<br>(CT–J410WR/J310WR) | |
| 3 | STOP | Set the DOLBY NR switch to the ON position. (DOLBY B) | | | | | |
| 4. | REC/<br>PLAY | Record the above signal onto the STD–631 test tape, and playback. | Deck II | VR301 (Lch)<br>VR302 (Rch) | TP. 1 (Lch)<br>TP. 2 (Rch) | Repeatedly record, playback and adjust so that the playback signal level becomes –11.2 dBV (CT–J410WR/J310WR) | |
| 5. | STOP | Set the TAPE SELECTOR switch to the CrO2 position. | | | | | |
| 6. | REC/<br>PLAY | Record the above signal onto the STD–621 test tape, and playback. | Check | | TP. 1 (Lch)<br>TP. 2 (Rch) | –11.2 dBV ± 1.5 dB<br>(CT–J410WR/J310WR) | |
| 7. | STOP | Set the TAPE SELECTOR switch to the METAL position. | | | | | |
| 8. | REC/<br>PLAY | Record the above signal onto the STD–610 test tape, and playback. | Check | | TP. 1 (Lch)<br>TP. 2 (Rch) | –11.2 dBV ± 1.5 dB<br>(CT–J410WR/J310WR) | |

# 7. TEST MODE

### 1 Entering the Test Mode

Supply the power with Pin 54 of the CPU (PD 3207A) connected to +5V.

### 2 Test Mode Operations

The BLE/SKIP LED will flicker while the test mode is operating, indicating that test mode is being set. During REC and REC PAUSE, the LINE MUTE opens in the same way as a deck sold separately.
Moreover, as the 5 seconds key mask immediately after the power is supplied will not be performed, test mode operations can be started immediately after mecha initialization.

#### (a) FL Check (CT-J410WR)

After the CPU RESET is released, the FL becomes a fully lighted display with only half of the luminance. As a result, disconnections and soldered bridges (the luminance of the bridge section will be normal) can be checked.
After mecha initialization has been completed, it can be returned to the normal display using any key input.

#### (b) Bus Port Operation Check

When the ENA/$\overline{\text{REQ}}$ pin (Pin 29) is set to "L", the SD pin (Pin 28) outputs the reversed level against the input level ("H" or "L") of the SCK pin (Pin 30).

| ENA/$\overline{\text{REQ}}$ (29 pin) | SCK (30 pin) | SD (28 pin) |
|---|---|---|
| H | — | — |
| L | L | H |
| L | H | L |

#### (c) Electronic VR (M51131L) Operation and ASES LED Checks Using the Reverse Mode

CT-J410WR switches the attenuation amount of M51131L when the reverse mode switches are used. CT-J310WR lights up the ASES LED.

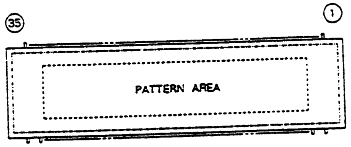
| Reverse Mode SW | CT-J410WR | CT-J310WR |
|---|---|---|
| | Attenuation Amount (dB) | ASES LED |
| ⇄ | –30 | NORM LED lights up. |
| ↩ | Adjustment can be made with REC VR. | LED turns off. |
| ⟲ | –1 | FINE LED lights up. |

### 3 Releasing the Test Mode

The test mode will be released and normal operations and displays will be set, when the ASES key is turned on with both mechanisms in the stop condition, or when the CPU hardware is reset.

# 8. FL INFORMATION

- **V1201 (RAW1097)**

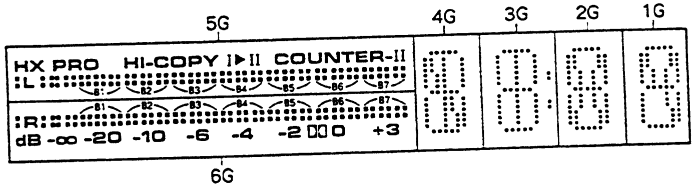


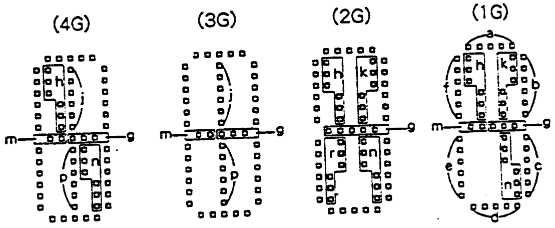
## PIN CONNECTION

| PIN NO. | 35 | 34 | 33 | 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONNECTION | F2 | F2 | NP | P13 | 6G | 5G | 4G | 3G | 2G | 1G | P6 | P7 | P8 | P9 | NP | NP | NP | NP |

| PIN NO. | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONNECTION | NP | NP | NP | NP | NP | P10 | P5 | P4 | P3 | P2 | P1 | P11 | P12 | P14 | NP | F1 | F1 |

Note: 1) F1, F2 ......Filament
2) NP .........No pin
3) NC ............No connection
4) 1G–6G ......Grid



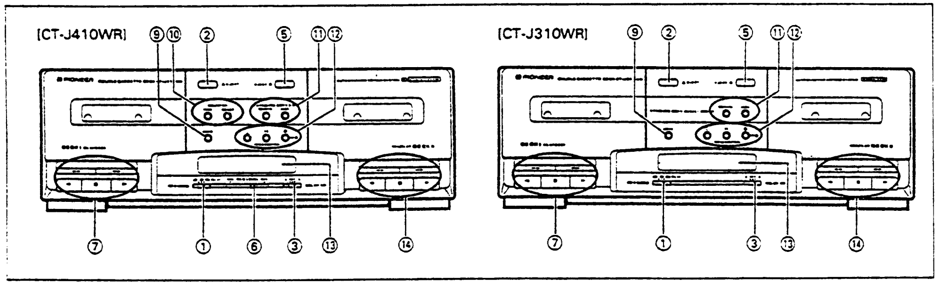


## ANODE CONNECTION

| | 6G | 5G | 4G | 3G | 2G | 1G |
|---|---|---|---|---|---|---|
| P1 | B1 | B1 | a | a | a | a |
| P2 | B2 | B2 | b | b | b | b |
| P3 | B3 | B3 | c | c | c | c |
| P4 | B4 | B4 | d. | d | d | d |
| P5 | B5 | B5 | e | e | e | e |
| P6 | B6 | B6 | f | f | f | f |
| P7 | B7 | B7 | g | g | g | g |
| P8 | dB –∞ –20 –10 –6 –4 –2 0 +3 | I | m | m | k, r | m |
| P9 | — | COPY I▶II | j, p | j, p | h | h |
| P10 | — | HI – | h, n | ∔ | n | k |
| P11 | — | — | — | — | — | n |
| P12 | :R | :L | — | — | — | — |
| P13 | — | HX PRO | — | — | — | — |
| P14 | — | COUNTER – I | — | | — | — |

# 9. PANEL FACILITIES

## FRONT PANEL FACILITIES



### ① REV (reverse) MODE switch

Use this to select tape travel direction during play and record.

| | |
|---|---|
| ⊐⊏ : | One-sided play and record. |
| ⊃ : | This enables auto reverse recording and auto reverse play. If you start with the tape running in reverse, only reverse play and recording are possible. |
| ⊂⊃ (RELAY): | This enables auto reverse recording and auto repeat playback.<br>The tape does not reverse if recording starts from the (◄) direction.<br>Select this position for DECK I and II relay play. |

### ② Deck I EJECT button

Press to open the cassette door.

*NOTE:*
*This button functions only when the power is turned on.*

### ③ DOLBY* NR switch

Set this switch to B or C for recording with the built-in Dolby Noise Reduction system and for playback of tapes which have been recorded using the Dolby Noise Reduction system. For other tapes, set the DOLBY NR switch to OFF.

*NOTE:*
*When playing back DOLBY NR-encoded tapes, always set this switch to the same position (B-type or C-type) used for recording.*

*
- *Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.*
- *"DOLBY", the double-D symbol ꟿ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.*

### ⑤ Deck II EJECT button

### ⑥ REC LEVEL control (CT-J410WR only)

Use to adjust the recording level. It adjusts the input signal level.

### ⑦ Deck I operation buttons

| | |
|---|---|
| ► (PLAY): | For playing back a tape in the forward mode. |
| ◄ (PLAY): | For playing back a tape in the reverse mode. |
| ■ (STOP): | For stopping the tape. |
| ►► (FAST): | Fast forward in forward mode, rewind in reverse mode. Music search (MS) starts if this is pressed during playback. |
| ◄◄ (FAST): | Rewind in forward mode, fast forward in reverse mode. Music search (MS) starts if this is pressed during playback. |

### ⑨ ASES button

This can be used when recording from a PD-J410/PD-J510/PD-J910M CD player or CLD-J910 CD CDV LD player. The A.S.E.S. (Auto Synchro Editing System) function automatically edits when recording from a CD to a tape.

### ⑩ COUNTER buttons (CT-J410WR only)

| | |
|---|---|
| TIME: | Use this to switch between tape counter number display and display of elapsed time.<br>The TIME counter operates only during playback and recording. |
| RESET: | Use this to reset the tape counter display to 0000. |

### ⑪ SYNCHRO COPY buttons

Used for tape copying.

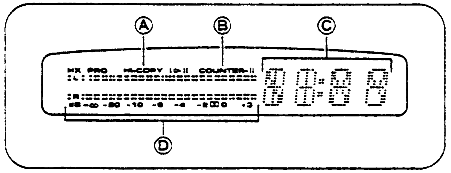
| | |
|---|---|
| NORMAL: | Copying from the deck I tape to the deck II tape at normal speed. |
| HIGH: | Copying at about twice normal tape speed. (Copies can be made in about half the NORMAL time.) |

### ⑫ DECK II CONTROL buttons/indicator

| | |
|---|---|
| O (MUTE): | Used for creating a blank space during recording. |
| ▮▮ (PAUSE): | Temporarily stops tape travel. |
| ● (REC): | To set to recording standby mode. Recording begins when you press the play button (◄ or ►) or PAUSE (▮▮) button. |

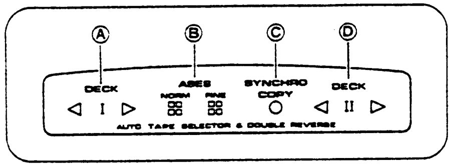
### ⑬ Display section

[CT-J410WR]



Ⓐ Lights during tape copy.
Ⓑ Indicates the deck (I or II) displaying counter indications.
Ⓒ Tape counter or time counter indication of elapsed tape time. During Music search operation, it indicates the number of tracks skipped. Also shows "ASES" and other indications.
Ⓓ Level meter
The ꟿ mark displayed on the level meter is the Dolby NR system standard level. Indicates pattern during "ASES", etc.

[CT-J310WR]

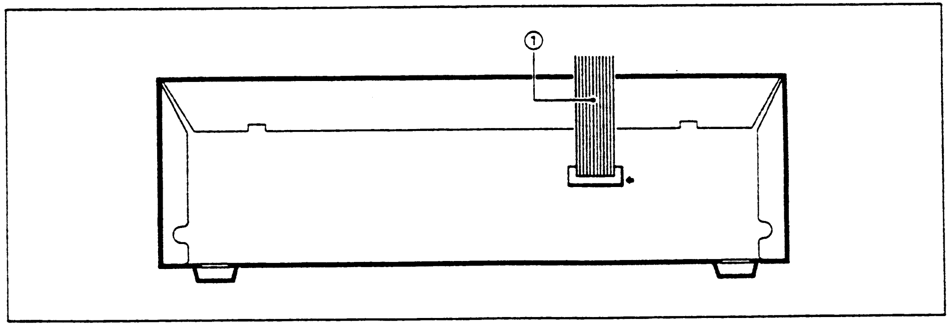


Ⓐ Displays tape travel direction of DECK I.
Ⓑ Lights during ASES MODE.
Ⓒ Lights during tape copy.
Ⓓ Displays tape travel direction of DECK II.

### ⑭ Deck II operation buttons

The same as the operation in ⑦ Deck I operation buttons.

## REAR PANEL FACILITIES



* Illustration shows model CT-J310WR.

### ① CASSETTE DECK system cable

Connect to the TAPE DECK jack of the tuner control amplifier.

# 10. SPECIFICATION

[CT-J410WR]

| | |
|---|---|
| Systems | 4 track, 2-channel stereo |
| Heads | "Hard Permalloy" playback head x 1<br>"Hard Permalloy" recording/playback head x 1<br>"Ferrite" erasing head x 1 |
| Motor | DC servo 2 speed motor x 2 |
| Wow and flutter | ±0.19 % (DIN)<br>0.09 % (WRMS) |
| Fast winding Time | Approximately 120 seconds (C-60 tape) |
| Frequency Response (– 20 dB recording): | |
| TYPE I (Normal) | 25 Hz to 16,000 Hz ±6 dB |
| TYPE II (HIGH/$CrO_2$) | 25 Hz to 16,000 Hz ±6 dB |
| TYPE IV (Metal) | 25 Hz to 17,000 Hz ±6 dB |
| Signal-to-Noise ratio | |
| Dolby NR OFF | More than 58 dB |
| Noise Reduction Effect | |
| Dolby B type NR ON | More than 10 dB (at 5 kHz) |
| Dolby C type NR ON | More than 19 dB (at 5 kHz) |
| Harmonic distortion | No more than 1.0 % (–4 dB: 160 nwb/m) |

**Miscellaneous**

| | |
|---|---|
| Dimensions | 360 (W) x 328 (D) x 120.5 (H) mm |
| Weight (without package) | 3.9 kg |

[CT-J310WR]

| | |
|---|---|
| Systems | 4 track, 2-channel stereo |
| Heads | "Hard Permalloy" playback head x 1<br>"Hard Permalloy" recording/playback head x 1<br>"Ferrite" erasing head x 1 |
| Motor | DC servo 2 speed motor x 2 |
| Wow and flutter | ±0.19 % (DIN)<br>0.09 % (WRMS) |
| Fast winding Time | Approximately 120 seconds (C-60 tape) |
| Frequency Response (– 20 dB recording): | |
| TYPE I (Normal) | 25 Hz to 16,000 Hz ±6 dB |
| TYPE II (HIGH/$CrO_2$) | 25 Hz to 16,000 Hz ±6 dB |
| Signal-to-Noise ratio | |
| Dolby NR OFF | More than 58 dB |
| Noise Reduction Effect | |
| Dolby B type NR ON | More than 10 dB (at 5 kHz) |
| Dolby C type NR ON | More than 19 dB (at 5 kHz) |
| Harmonic distortion | No more than 1.0 % (–4 dB: 160 nwb/m) |

**Miscellaneous**

| | |
|---|---|
| Dimensions | 360 (W) x 328 (D) x 120.5 (H) mm |
| Weight (without package) | 3.9 kg |